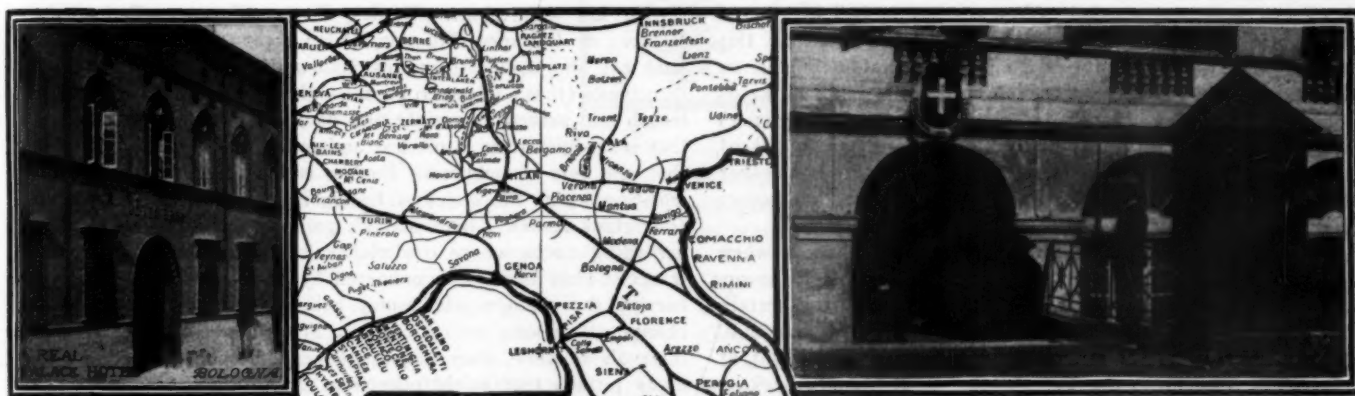


# THE AUTOMOBILE

## ITALY for the AUTOMOBILIST

By FRANCIS MILTOUN



ITALY for the automobilist is not France, not by a good deal. Its roads are not French roads, and its hotels are not French hotels—more's the pity! And you pay two prices for everything that matters to the automobilist. Gasoline comes in the American five-gallon can of commerce that you find in China, Dahomey—and Italy, and here you pay for five gallons a price often double what you pay for a more volatile spirit in France. Oil—any old kind—costs a franc and a half a kilo, which is dear or not, according as to where you have done most of your automobiling in the past, but as it does not give as good results, nor go so far as that you get in France, so oil, too, works out as high-priced as gasoline.

You buy all these things at a drug store or a grocer's. That is, you can buy them there if you wish, and at a better price than at the average misnamed "garage," which in Italy is often an establishment where they sell sewing machines, agricultural machinery, baby carriages, and bicycles. In the small town you are bound to go to the drug store for your supplies, but as you can get your quinine at the same time—which you will have need of in fairly large doses—it does not so much matter.

All these variations on the automobilist's ordinary procedure

are not so serious as to take away entirely from the enjoyment of automobile touring in Italy. The worst is the fact that a larger extent of bad road will be encountered in a week's touring in Italy than will be met with in a month in France.

night forced to you'll be automobiles inferior and most

What weather Italy and notably tirely upon what professes to be a he says, invariably an automobilist in ological surprises. "Domini Deo!" you say when you strike a bad road and you praise God for the good. *Avanti* is ever the watchword in Italy. You mustn't stop for an occasional bit of bad road. It won't improve, at least not while you wait.

The above are some of the bad points of automobiling in Italy. For the good things of life let us be fair and admit that Italy does not lack them utterly. Their infrequency is what mitigates against one's appreciation of them; or does it work the other way about? It all depends upon the individual mood.

A dozen, twenty or fifty kilometres of good road through Æmelia suddenly descends into a mere trail. That is a bad piece of management and you think so when, after you have had a dozen kilometres of it, it suddenly becomes good again. Maladministration, the poverty of a certain baliwick, or indif-

Italy's hotels, taken by and large, are neither so good nor so reasonable in price as those in France, and you invariably pay for garaging your machine two or three francs a—which you are not often do in France—and often obliged to stable your outside the hotel, in an incommodious shelter.

one will have along the road in in the Campagna depends on God wills. No Italian peasant weather prophet. "Ah, Signore," bly, "chi lo sa?" For this reason Italy must be prepared for meteor-



A Typical T. C. I. Road Sign.

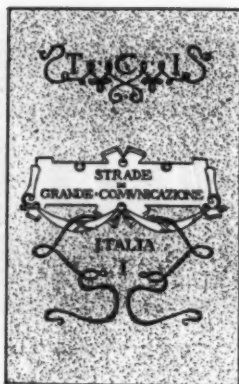
ference or incompetence on the part of some one in power accounts for this state of affairs.

You buy your gasoline along the route, usually at 14 francs the five-gallon tin, when suddenly, without any warning, and without a thought on your part as to the propriety of asking the price beforehand, you are mulcted 18 francs for the same thing. You put that down to bad management, too, a sort of a sacrificing of the goose that lays the golden egg. You suffer, perhaps in silence, or perhaps not, but some day the thing will regulate itself and the next comer will have no such trouble. One hopes! Automobile touring in Italy is still in a chaotic stage; good in parts and bad in parts, like the curate's egg.

You occasionally find a very good hotel, with ample courtyard accommodation for your automobile, well-sheltered and well-lighted, where you yourself lodge and feed comfortably and well at a reasonable price (higher than in France for the same accommodation, however), but at your very next stopping place you are "exploited" and made to eat beefsteak and fried potatoes when what you wanted was a chicken and a dish of macaroni and a salad. You are put to bed in a regal apartment with electric lights everywhere. And with all this pretended luxury you are forced to put your automobile in an outhouse with loose straw and broken bottles. It takes all kinds to make up the gamut of one's automobile and hotel experiences in Italy. One does not speak, of course, of the palace hotels of the Quai Parthenope or the Lung' Arno; they are in another class, but they are nothing Italian, and are not what one comes to Italy for.

It simply comes to this: one has got to take chances when touring Italy in an automobile. If he keeps to the large towns and frequents only the tourists hotels he is sure of a certain cut-and-dried conventionality, neither good nor bad, but dull. But if he makes his stopping place for a meal or a night at Barberino di Mugello in the Tuscan hills, or at Subiaco back of the Alban Mountains, near Rome, he does take chances. He may fare well or ill, but he won't be exploited unduly, and will probably be well cared for, indeed, humbly but amply; the food will have character; the wine will be good, though perhaps strong; and to be lodged in some quaint beam-ceilinged old room of a mediæval chateau will give one the pleasantest of dreams.

There is a good thing to say of the garages of the cities, those of the Garages Ruiniti, Fiat, Alberti, Storero, at Turin, Milan, Genoa, Padua, Florence, Rome, and Naples. They can hardly be excelled by any similar institutions to be found anywhere. It is to be regretted one cannot give the same praise to a den of bandits conducting a so-called garage at Pisa. The hotels are forced to send the inquiring automobilist there because there is no other. There is one hotel that won't do so any more. *Verb sap.* Automobilists, don't put off until Pisa anything that by any human means you can as well accomplish before or after or go without. Of these other most excellent garages it can be said that their ac-



commodations are ample and luxurious, prices moderate and invariably uniform, and stocks of tires and accessories most complete. What more does an automobilist want?

In Italy, of all countries, this is to be appreciated, and would be in England, where the gas-fitter mechanic is still allowed to hang out his shingle and tamper with the intricacies of a ten thousand-dollar auto whenever a confiding stranger of that ilk is obliged to leave one in his hands.

In Italy, as in France, one finds in garages a real mechanic, one who has a knowledge of automobiles and their functions. No gas-pipe threads or bolts come from his hands. Give him time and he will cut a "Whitworth," a "standard" or a "Metric" thread for an odd-sized bolt for an

American or English car, and will not hammer or force it unwillingly into place. The Frenchman is a good automobile engineer and mechanic, but the Italian is running him close, else why would the Fiats, Itals, and Isottas be gathering the plums that they are.

Not every automobile tourist in Italy covers the entire country in his wanderings. Naples, Rome, Florence, Padua, and Venice; or Florence, Bologna, Milan, Como, and then Switzerland are the usual itineraries followed, and because of their directness (there is one road through Æmelia 32 kilometres in length and perfectly straight and flat), and conventionally much that is really Italian is missed, and much that is the same thing that one gets elsewhere in Europe is included. In the articles which make up the series of Italian itineraries here outlined are four chief routes, which may be combined or taken separately, according as to where one makes his respective exit and entrance. They have been connated by personal observation, and barring the changes which may be expected to arise from the change of seasons, or such as are brought about by even brief intervals of time, they may be depended upon to lead out of many pitfalls that might otherwise cause annoyance and delay. They cover the best of Italy, on and off the beaten track; the roads are of the best—and the worst; there is the seashore, the mountain, and the plain.

If one would push on further and descend into Calabria, he must be prepared to take chances—not necessarily with brigands, though perhaps he may have some experience of them, too—

with very, very many of the conventional discomforts of travel. One must literally be as tough as hickory, as patient as an owl, and with the stomach of an ostrich, if he is to come back safe and sound and wholly satisfied with his round from, say, Naples to

Reggio in Calabria and back again, or to Otranto and Brindisi. The thing is worth doing, however, by any one with sporting proclivities, though the road is easier to follow than to ride

over. But one can do it. The following hints as to ways about will be useful:

For maps, get the French-made "Carte Taride d'Italie." It is in three sheets, covering all of Italy, including Sicily, and is printed in three colors. It is very easy to read, plainly

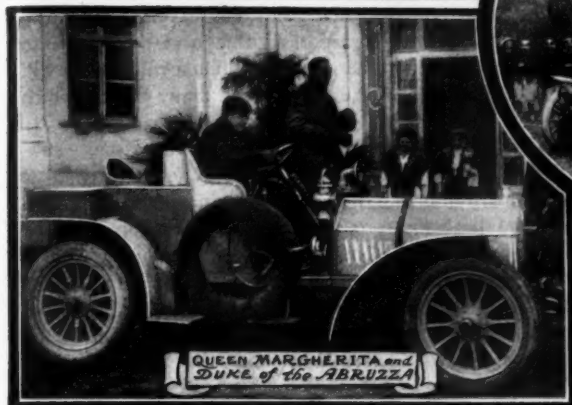


## A CONTRAST



## ROYAL ITALIAN

## AUTOMOBILISTS



marked and cheap, costing only a franc a sheet. It does not distinguish the good roads from the bad as well as it might be made to, and many of the minor crossroads are omitted altogether, but in general it is a very satisfactory map, and the most legible of any made covering Italy up to the present writing.

For absolute accuracy there are no road maps of Italy as good as those issued by the Touring Club Italiano. They are presented gratis to members of that excellent organization, and sold at a low price to outsiders. The objection is that it takes 58 sheets to cover Italy. The hills between 4 per cent. and 7 per cent., and those above 7 per cent. are marked plainly, the altitudes are given throughout, and the great lines of communication by road are marked as to the quality of their surfaces.

Another similar series of Italian road maps is the "Carta d'Italia Sistema Becherel-Marsieni," scale one 250,000ths, 35 sheets, printed in colors, with a system of roads classification, and selling at a franc a sheet. It is similar to the Italian Touring Club map and is everywhere obtainable. For this reason it will perhaps best serve the visiting automobilist who has not provided himself with maps before hand.

Guide books for the automobilist in Italy are as follows: The most useful of all is the "Annuario di Touring Club Italiano," with plans showing exits and entrances to all the chief cities and towns, the location of the principle hotels, garages, etc., besides a mass of useful contributory information.

Next in importance, and of inestimable value, are the three volumes published by the Italian Touring Club, entitled "Strade di Grande Comunicazione," with detailed itineraries, and illustrative profiles of the elevations along the road, showing all rises and falls in an unmistakable manner so that he who runs may read.

Baedeker's or Murray's guide books have little or no information of value to automobilists, though some of the large scale maps of certain regions in the former may be found useful in making excursions from a center. In this class are the maps of the Italian lakes and the environs of Naples, Rome, Florence, etc.

For hotel lists there is nothing to be compared with the "Annuario" of the Italian Touring Club, but those given in the

"Annuaire pour les Pays Etranger" of the Touring Club de France and of the Automobile Club de France are good as far as they go. Joanne's "Italie" (in French) lists Italian hotels having garage accommodations for automobiles, and in this respect is ahead of any regular guide book published in English. Some of its large scale maps, too, are good. Indeed, it is a very useful book for the traveler by road in Italy.

The road signs of Italy are not what they are in France. They are neither so frequent, so conveniently placed, nor so well kept. They are often found wanting at some particularly puzzling crossroads.

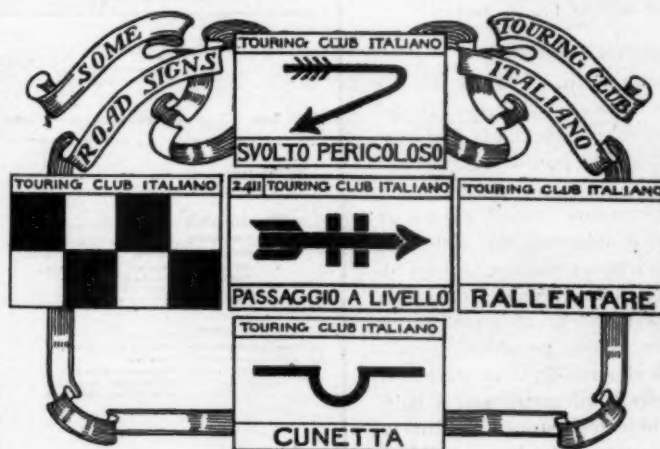
The privately-placed road signs, those found here and there throughout Italy, erected by the Touring Club, are all sufficient and very readable, and in certain sections, as in Venetia, the local automobile clubs have rendered similar services. So far as they go the privately-erected road signs of Italy are distinctly good, but the government itself has been remiss.

There is nothing in the way of sign-posted information which gives the percentage of the rise on a hill, however, as in France, and the information to be acquired from local sources is often unreliable.

From Florence to Bologna, via La Futa Pass, is an easy enough hill-climb, if you don't stray from the main road; if you do you may strike a bit of 17 per cent. hill, or another of 25 per cent., for a kilometre or more, as the writer did. And at Florence, in the garages even, they will not tell you that there is an easier route via the aptly-named Montepiano, or via Pistoja and La Poretta. Either of these is a much better road than the main route over La Fute, which in spots rises and falls from 8 to 10 per cent. for a considerable distance, and the itinerary is hilly throughout. The distance by the direct road is in the neighborhood of a hundred kilometers, and by La Poretta perhaps twenty-five more.

Road building in Italy has not reached the height that it has in France. This seems mainly to be because of a lack of unity of purpose on the part of the various road-building authorities.

Throughout north Italy the "good roads" are as good as any "good roads" anywhere, and that's saying a good deal when one admits France into the





simple than in France. With the largest cities, except in and out of Milan and Torino, the exits and entrances are awful, particularly at Genoa and Naples—and Spezzia, always Spezzia. Florence is bad enough, coming from the west or south, but the exits to the north are good. Most Italian cities and towns have a great encircling road, the Strada di Circonvallazione, which diverts a vast traffic from passing through the centre of the town. The Italians beat the world here. We must all take this leaf from out their road-making book.

The Minister of Public Works is responsible for the laying out, building, and repairing of the national, provincial, and communal Italian roads. The national roads, properly speaking, are those which connect the chief cities of the kingdom with each other and the seaports. The provincial roads connect the capitals of the different provinces, and the capital of a province with the county seats, and again link these cities and towns up with their nearest seaports. The communal roads are those running between the small cities or large towns. Below these ranks are other roads of merely local use and value.

The Italian classification of roads follows largely that of the French; perhaps it is their common origin in the Roman roads of old that accounts for this. The national and provincial roads of Italy have a width of eight to ten metres and the communal roads five to six metres.

Every automobilist in Italy should know something about the Roman roads of old, just in order to understand why the present lines of communication are laid down where they are, and why they often go straight up and over some Tuscan hill instead of going around.

"Those ancient roads,  
Deserve they not regard! O'er whose broad flints  
Such crowds have rolled,  
So many poms, so many wondering worlds."

Thus sang some poet of old, and with reason. What he did not take into consideration was their degeneracy to-day, their abrupt rises and falls in a hilly country, and their shockingly bad surfaces. The flints are not all broad on Italian roads, neither are the ruts.

The word *viae* with the Romans meant any sort of a road or highway, but more particularly was it adopted for historical references to those great lines of communication, surveyed, paved, and well cared for throughout all the régime of consuls and emperors. These Roman ways were above all strategic, as became the genius of the warring, conquering peoples.

The great Roman roads were marked with division stones or bornes every thousand paces, practically a kilometre and a half, a little more than our own mile. These mile-stones of Roman times, many of which are still above ground (*milliarii lapides*)

classification. But there are shockingly bad bits, even in the Italian lake district, near Lecco; on the great high road between Ferrara and Padua, just out of Ferrara, in fact; while the road from Spezzia to Pisa is unspeakable, to say nothing of being practically unridable.

The road surfaces in Italy in general are not nearly as good as they ought to be, and the upkeep is inefficiently performed.

Getting in and out of the small towns is not so bad, and the passing through the towns is often much more direct and

were sometimes round and sometimes square and were entirely bare of capitals, being mere stone posts usually standing on a squared base of a somewhat larger area. A graven inscription bore, in Latin, the name of the consul or emperor under whom each stone was set up and a numerical indication as well.

Caïus Gracchus, away back in the second century before Christ, was the innovator of these aids to travel. The automobilist appreciates the development of this accessory next to good roads themselves, but if he stops to think a minute he will see that the old Roman was the innovator of many things which he fondly thinks are modern.

The greatest of all Roman roads was the *Viae Appia*, running from Rome to Capoul, the Appian Way of to-day over which automobiles, hunters and race horses fume and gallop in an effort to bury all thoughts of the past and keep up the pace of modernity. The young Roman of to-day is a very sporty individual, though he has got his ideas of sport from Anglo-Saxons. One fancies, when he comes to think of it, that the sportsman chariot-driver, runner, discus-thrower, or even gladiator of the old days was a good deal more thorough a sportsman nevertheless.

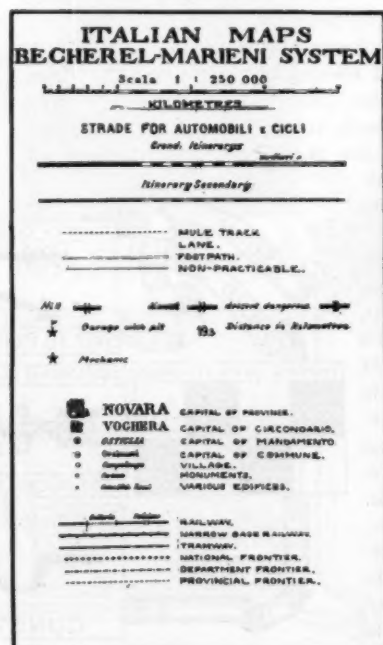
The desire for the quick transport of troops was the chief reason for the tracing and building of these famous Roman roadways, and the art sense was given full play at the same time, for these highways were refined and beautified by monumental and artistic bridges, arches and trophies. Even in Gaul these things were numerous, and to-day many of them are in an admirable state of preservation. Automobilists, coming to the French and Italian Rivas, will recall this when rolling over the *Viae Aurelien*, where, at Saint Chamas, is still the sublime Pont Flavian arching the roadway, as well as the Touloubre, or when viewing the old mile-stones at Salon and Saint Maxim and the now crumbled and desolate trophy at La Turbie.

At Rome, in the very geographical center of the empire, before the Basilica of Julia, was erected by the great Augustus a great *milliarium aureum*, a golden mile-stone—from which all the roads radiating from Rome took their departure. All along the length of the main roads were other mile-stones, many of them monumental and commemorative, and some even serving as roadside tombs of some good man or great.

Nine great roadways left this golden mile-stone leading to the ends of the kingdom. They were the *Viae Appia*, ending at Brindisi; *Aurelia*, traversing Etruria and Liguria and ending at Ailes in the Narbonnais; *Claudia*, which crossed Etruria; *Flaminia*, extending to Bologna; *Lata*, a subsidiary connecting roadway joining the *Flaminia* with the capital; *Latina*, a similar road, connecting with the *Appia*; *Salaria*, running east to the Adriatic; *Trajana*, also extending to the Adriatic; and finally *Valaria*, crossing the Sabine country.

Up to 312 B. C. these Roman roads were mere dirt roads, but when Appius Claudius set about to pave a Roman street he gave that impetus to road building which places the Romans firm in history as the first and greatest road engineers and builders.

This first road projected by Appius Claudius—an experiment it may be presumed—became the famous Appian Way leading to Capoul. Then came progress rapidly.





## "GARDEN" IS TO BECOME A "CIRCUS MAXIMUS"

IT IS no easy task to supply a word picture of the plans of the decorative scheme of a big automobile show. Therefore, herewith is presented much of the material that comes from Press Agent Jervis concerning the "Ninth Annual Automobile Show" in Madison Square Garden, January 16 to 23, inclusive:

For many years Madison Square Garden may be said to have been to New York what the Circus Maximus was to ancient Rome. In the Garden the big shows, such as the "Wild West" and the circus with its chariot races, have held forth, similarly as the big races were held on the concourse of the Circus Maximus. Yet in all its history of varied service the Garden never has been treated by any showmen or decorators as if it were related to the famous Roman arena. The novel idea of doing this remained to be taken up by the promoters of the annual automobile show. The idea is now being carried out for the ninth national exhibition, to be held under the auspices of the Association of Licensed Automobile Manufacturers, January 16-23. The result will be an entirely new handling of the big amphitheater from a decorative viewpoint, simple and yet magnificent beyond all previous occasions.

In seeking to produce within the Garden a semblance of the Circus Maximus, the primary thought was to "open it up" and give the impression of spaciousness. All the signs and decorations of the main floor will be subordinated to this idea and kept lower than usual, so as not to interrupt the view from end to end.

In working out this idea, W. W. Knowles, the architect, who conceived it, and who has done the designing for the whole show, has missed no point of which advantage might be taken. The layout of exhibitors' spaces, of the elevated platform, the galleries, railings, and other features, will be made to lend themselves to the idea, by being all in curved lines instead of angles. Most important in obtaining this effect is the building of the platform over the entrance, which for the first time will be in the shape of a half circle, so that from the entrance the mirrors will make it seem that one is standing within a complete ellipse and looking far away toward the other end of it.

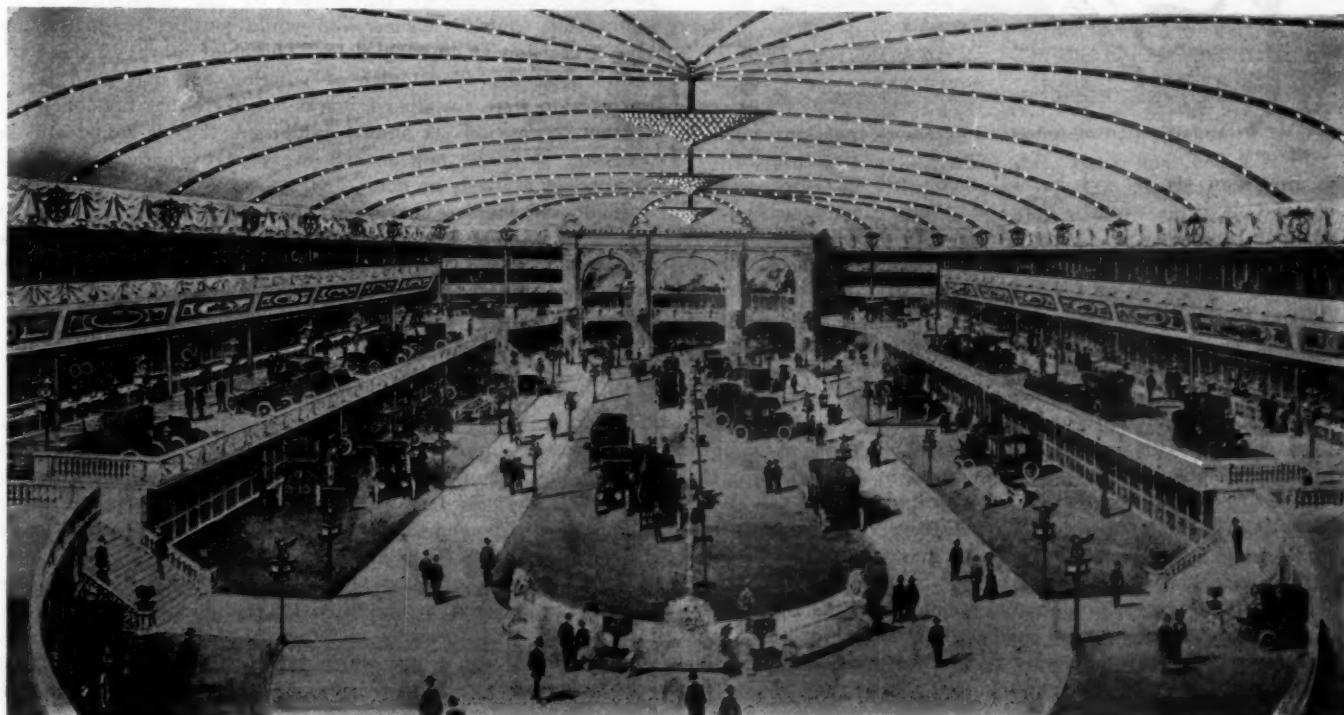
The actual work on the decorating and the execution of Mr. Knowles' designs is in charge of S. R. Ball, who has done this

work in former years. For the main floor the color scheme is brown and white and green, beneath a sky of azure blue. Immediately beneath the canopy of blue the girders of the Garden dome will glitter with myriad incandescent lamps, and a new feature of lighting will be found in twenty-five flaming arc lights, with colored shades, that will depend from the iron beams of the roof.

The floor beneath will be carpeted with green, where the exhibition spaces are, and bare boards will serve for aisles. In a row down the center and at all the spaces of the sides will be white lamp-posts that will inform visitors of the names of the exhibitors, and will be also guide-posts, directing them to the various departments of the show. Between the central row of posts will be tufted seats. Opposite the Madison avenue entrance will be a low electric fountain of gray stone, that will sweep in a curve about the foremost exhibits of the central space, the convex side being toward the entrance. In the basin of the fountain, beneath plashing sprays of water illuminated by parti-colored lights, goldfish will disport themselves, while real pond lilies ride upon the wavelets.

At the Fourth avenue end of the main floor will be the masterpiece of the whole great plan, the big triumphal arch, having three bays and extending from floor to roof.

The elevated platform will be supported from the main floor by white Doric pillars, and also the steps leading to the platform will be white. The walls back of the platform will be finished in panels of brown burlap, and in the beveled soffit, between the walls and the facing of the gallery, will be oval panels containing frescoes that depict the history of vehicular progress. These illustrative panels will be on both sides of the amphitheater and the pictures will tell the story of man's advance in personal transportation from his seat astride the little ass to his seat at the wheel of an aeroplane. Above these colorful panels will be the face of the gallery draped in white bunting; back of this the side wall will show in brown burlap and above between the sky line and the vertical decorations, will be an apron of white bunting, tufted and festooned, and pinned at places by the new show emblem of the A. L. A. M.



Main Floor of Madison Square Garden as Arranged for the A. L. A. M. Show, January 16-23.

Even as the main floor, the different departments of the show in various parts of the Garden, will have a wholly new treatment. Nothing more novel ever has been introduced in decorations than the latticed arbor that will hood the concert hall with an arch 42 feet in span and 28 feet in height.

In the café, just off the foyer of the Madison avenue entrance, where are to be the electric vehicles, another strikingly novel scheme will be presented. Here the exhibits will appear beneath an Italian pergola, and as one looks over or between the cars he will get the impression of looking over a stone wall upon an Italian landscape.

In the basement, the white and brown color scheme will be maintained, and the rathskellar, which has been a feature for two years, will be more interesting than ever.

### AMERICANS WHO WERE AT THE SALON.

PARIS, Dec. 17.—There was an exodus of American automobilists from Paris on the closing of the Salon at the end of last week. Among those who crossed the Atlantic to attend

**SPLITDORF**

**LA VOITURETTE**

**S**éparation organique.  
**P**our une magnétique  
**L**égèreté et fine-  
**I**nduction parfaite.  
**T**outes pièces interchangeables.  
**D**onneur de fonctionnements.  
**O**util des routes de l'Amérique.  
**R**endement exceptionnel.  
**F**acilité de pose.

M. J.-S. MACK, l'un des  
Directeurs de la Maison  
SPLITDORF, de New-York,  
invite cordialement  
les constructeurs de  
"Poids Lourds,"  
Grosses Voitu-  
res, Voiturettes,  
Moteurs,  
industriels  
et

à double  
allumage, pré-  
sentée pour la pre-  
mière fois en Europe  
au Stand 8, Salle F.  
Grand Palais.  
Plus de 20.000 Magnétos  
SPLITDORF sont aujourd'hui  
en usage dans les deux Amé-  
riques, au Japon, en Australie,  
etc., etc., etc.  
La Magneto SPLITDORF,  
de plusieurs années en avance sur les  
types actuels, sera la révélation de Salon  
Français de 1909.

First Indication of American Accessory Invasion.

the European shows and hurried home for Christmas were: Charles C. Clifton, of the George N. Pierce Company, Buffalo; David J. Post, of the Veeder Manufacturing Company, Hartford, Conn.; J. D. Maxwell, of the Maxwell-Briscoe Motor Company, Tarrytown, N. Y.; Mr. and Mrs. Emil Grossman, William Hyslop, automobile agent in Toronto, Can.; Russell Huff and H. D. Wilson, respectively chief engineer and European representative of the Packard Motor Car Company.

Mr. Wadsworth, of the Michigan Steel Boat Company, has gone South, and will sail from Naples on the *Caronia* December 22, in company with his wife and family. Another automobile passenger on the same boat will be Howard B. Coffin, of the Chalmers-Detroit company, who visited the London and Paris shows. Mr. King, formerly of the Northern company, who has been resting in Europe for several months, will stay here together with his wife until the spring.

John L. Poole, now European representative of the Buick company, and for several years chief selling agent in Europe of the Oldsmobile, soon intends to sail westward, severing all connections with the European market. After undergoing an operation at Chicago and resting for several weeks at French

Lick or Hot Springs, Mr. Poole will take up an engagement in the States, the nature of which he is not yet ready to communicate.

Joseph Mack and Paul L. Snutzel, who have visited Europe on behalf of C. F. Splitdorf, will return home after making a tour of the Belgium factories, sailing from Antwerp on the *Zeeland* December 19. They will both return to Europe later in order to terminate arrangements for Splitdorf agencies in Europe. Mr. Mack declares that the results of the stand at the Paris Salon have exceeded all expectations; the Splitdorf coils and electric appliance have been well received by European constructors. The interest in the first American magneto to be placed on the European market is proved by the fact that arrangements have been made for the magneto to be tested on the cars of the following important manufacturers: Pipe, Gregoire, Bianchi, Pilain (of Lyons), Rollain-Pilain, La Buire, Delaunay-Belleville, Delahaye and Roy, of Bordeaux.

Charles C. Clifton declared that the most striking tendencies of the Paris Salon is toward the construction of small two and four-cylinder cars, rated at 8 to 12 horsepower in France, but which would pass for 15-20-horsepower models in America. "Practically every constructor of importance has produced such a model for the coming season, the supply apparently being so great that one may wonder if it will not exceed the demand. There is a lot of interesting matter tending toward the simplification of all mechanical organs; there are also plenty of new mechanical features well worth watching. A striking tendency is toward the adoption of dark colors for automobile bodies, this being so general at the present show that a light-colored car is a distinct novelty. It seems evident that there is a desire to avoid the necessity of frequent washing."

### TO SHOW OR NOT TO SHOW, IS THE QUESTION.

PARIS, Dec. 15.—It is now for the Automobile Club of France to decide whether there shall be a salon in 1909. Recently a deputation of nine of the leading constructors, representing Renault, Dietrich, Panhard, Delaunay-Belleville, Brasier, Motobloc, Gobron and Bayard-Clement, waited on Gustave Rives, organizer of the salon, and informed him that a large number of important firms had decided to take no part in any show next year, and requesting that no salon be held until 1910.

The only reply that could be given by Gustave Rives was that he would communicate the wishes of the deputation to the Automobile Club of France, who would consider the matter and give a decision at an early date. The chief mover in the Paris shows took the opportunity of pointing out that even if the Paris Salon were abandoned, it was not likely that London would consent to cast off its annual exhibition, thus it would still be necessary to create new models every year whether they could be exposed at Paris or not.

Small car builders have also met to consider which party they shall support, but were unable to come to a decision. The accessory men are strongly in favor of a show, while aeroplane constructors believe that a salon every year would be a valuable means of developing their branch of the industry.

### NEWARK WILL HAVE ANOTHER SHOW.

NEWARK, N. J., Dec. 21.—Newark will hold an automobile show from February 20 to 27. The State Military Board has granted the use of the new Essex Troop Armory, in Roseville avenue, to the New Jersey Automobile Trade Association, which organization will conduct the affair, which will also be held under the auspices of the First Troop, N. G. N. J.

H. A. Bonnell, of East Orange, treasurer of the American Automobile Association, has been selected to manage the show. Mr. Bonnell was formerly secretary of the New Jersey Automobile and Motor Club, which position he relinquished last year to become secretary-treasurer of the Associated Automobile Clubs of New Jersey.





Farman Trying Out His New Aeroplane over the Plain at Châlons.

PARIS, Dec. 17.—James Gordon Bennett has offered a cup valued at \$2,500, which will doubtless take the same position in the flying-machine world as was held by the Bennett trophy in the realm of the automobile. In addition to the cup, to be competed for annually, there are three prizes of \$5,000 each to be paid out in cash to the winners of the trophy in 1909, 1910 and 1911. The trophy has been placed in the hands of the Aero Club of France and must be put up for competition by them under regulations to be drawn up by the International Aeronautical Federation.

The scene of the first race will be in France, the succeeding races to be held in the country of the club winning the trophy, as was done for the Bennett automobile cup.

The first race will be held over a distance yet to be decided upon, either in a straight line, in a broken line or over a closed circuit, the winner being the one who completes the course, or in case several complete it, the one making the fastest time. General regulations for the race must be decided each year before the end of January by the International Federation, engagements being received until March 1, and the race run between May 1 and November 15. Each federation or club has the right to enter not more than three competitors for the Bennett race, with the same number of reserve men, the competitors and reserve aeronauts being of the nationality of the club.

#### Club Accepts President Roosevelt's Offer.

NEW YORK CITY, Dec. 22.—At a meeting of the medal committee of the Aero Club of America President Roosevelt's offer to present the gold medals awarded by the club to the Wright brothers, in the East Room of the White House, was formally accepted. The club originally invited the President to make the presentation in New York, which was declined and the above offer made. It is anticipated that the presentation will take place some time during the week of January 23.

The committee has selected the design submitted by Victor D. Brenner from the numerous sketches made by various artists. The obverse will bear a portrait of the Wright brothers, while the reverse will show an accurate representation of the Wright aeroplane in full flight, in addition to the seal of the club. The medals will be three inches in diameter and of gold, though a number of replicas in silver and bronze will also be struck off. The cost is estimated at \$2,000, of which over \$1,200 has already been raised. At the request of the medal committee, Congressman Herbert Parsons, who is a member of the club, will introduce a bill into Congress asking that official cognizance be

taken of the achievements of the Wright brothers by presenting them with a special Government medal in appreciation of the fact that they have placed America in the front rank in the science of aviation.

The annual dinner of the Aero Club will be held in New York shortly after the presentation of medals at Washington.

#### Wright's New Records.

LE MANS, Dec. 18.—By remaining up for a greater length of time than has yet been possible to any other aviator, by flying a greater distance than had previously been covered, and by ascending to a height not hitherto attained by a heavier than air machine, Wilbur Wright again demonstrated his complete mastery of the air

to-day. The first trial was undertaken at 10:12 A. M. and was an official attempt at the Michelin prize for distance. This is a cup offered by M. Michelin for the greatest distance made by an aeroplane during 1908. Mr. Wright continued to circle the aerodrome until 12:05, during which time he went round the Auvours circuit 45 times. According to an official of the Aero Club who was present, this was the equivalent of 90 kilometers, but as Mr. Wright circled the posts wide at each turn, the actual distance covered is said to have exceeded 120 kilometers, or about 72 miles.

During the afternoon Mr. Wright competed for the height prize offered by the Aero Club de la Sarthe, and in less than ten minutes after leaving the ground demonstrated conclusively that the limitation of 328 feet imposed by the captive balloon anchored on the circuit for the purpose was a mere nothing. After circling around several times he sent his machine well above the balloon, at a height estimated at 360 feet.

#### F. S. Lahm Seeks Aeroplane Capital.

NEW YORK CITY, Dec. 21.—On the French liner *La Provence*, arriving here yesterday, were Frank S. Lahm, father of Lieutenant Lahm, now at Fort Myer, Va., in charge of the Government aeroplane tests, and Cortland Field Bishop, president of the Aero Club of America. Mr. Lahm has been a resident of Paris off and on for the past 30 years, but he is an enthusiastic American and a strong believer in the fact that the Wright brothers' methods of aviation will eventually be adopted universally, either commercially or for purposes of warfare.

Speaking of his experience in flying with Mr. Wright, Mr. Lahm said that it was a bit exciting at first, but taken all in all was a most delightful sensation. "It was as if we were on a steamer in a calm sea with a gale of wind driving past us," he continued, "or sitting in a chair exposed to a strong breeze. Had I not seen Mr. Wright alight a great many times, our sudden drop would have been unnerving, as we came down at the rate of a mile a minute in big spirals, until when near the ground the machine was manipulated so that it came to earth without a jar. I expect to see a Wright machine make a flight across the English Channel and back before next spring."

Cortland Field Bishop said that the Wright brothers had become the idols of all France, and that Orville Wright's intention was to establish a school at Pau, upon his return to Europe. "I am informed that the Wright brothers will begin the manufacture of aeroplanes on a large scale," said Mr. Bishop, "the best ones costing about \$5,000, with small ones as low as \$1,000.

## HOW THE A. C. F. IS KILLING ITS GRAND PRIX

PARIS, Dec. 17.—Engagements are open for the French Grand Prix, to be run on the Anjou course in "Chateauland," July 2, 3 or 4. For \$1,000 a single car not exceeding 130 millimeters bore can be entered; for two racers the price is \$1,800, while for a full team of three the sum of \$2,400 must be paid over to the Sporting Commission of the Automobile Club of France. But if automobile constructors want to race over the smooth roads in the neighborhood of Angers they must pay down their cash with unusual promptitude, for the Racing Board has taken the decision to abandon the Grand Prix unless forty entries are received at 6 p. m. on Thursday, December 31. In other words, the Sporting Commission of the Automobile Club of France has decided to kill its own race. Lacking sufficient courage to put it out of existence with an honest blow, they have imposed such conditions that there is nothing to be done but accept the Grand Prix as dead and awaiting a formal interment.

Seventeen European firms, comprising Benz, Brazier, Bayard-Clement, Dietrich, Germain, Mercedes, Motobloc, Panhard, Renault, Berliet, Deon Bollee, Darracq, Delaunay-Belleville, Isotta-Fraschini, Minerva, Peugeot and Pipe, have signed an agreement not to take part in any race in 1909, and further, to do everything in their power to prevent outsiders using their cars for racing purposes. Breakage of the engagement will incur a penalty of \$20,000.

The result of this agreement is that the possible number of starters in the next Grand Prix is reduced by twenty-four. In 1906 there were 32 cars in the French Grand Prix; in 1907 the number was 37; this year there were 48 starters at Dieppe. Deduct 24 from the highest of these figures and we are still far from the 40 which the club must have for its annual race.

Officially the reason for this minimum is that the race cannot be made to pay with a smaller number of cars. One does not need to be a mathematician, however, to figure out that since the 1908 Grand Prix realized a profit of about \$30,000 with 48 starters, and that the 1907 race gave a credit balance of about \$10,000 with only 37 cars, it is possible to hold the race with even 30

cars or less and still have a balance on the right side. Another reason for putting this ban on racing is that long distance speed contests are too costly for the manufacturer. No one denies the truth of the statement, but with the profits already in hand and obtained each year the objection could easily be removed if there was any desire to do so.

The truth of the matter is that the big French manufacturers have got cold feet. Dieppe disheartened them; Bologna discouraged them still further; Savannah had no influence whatever, for there was not a manufacturer in France or an engineer acquainted with the cars who had the least hope of seeing a French machine carry off the trophy.

But for outside pressure and liberal help from the tire firms not a single French car would have been sent across the Atlantic.

For the present entries are open, and indeed three have already been received by the secretary of the racing board, the firm being Cottin-Desgeuttes, of Lyons, and the cars four-cylinder models of 130 millimeters bore and 200 millimeters stroke. A small group within the club and a still larger group without have hopes that the forty cars may be found in the twenty-one days allowed, thus forcing the club to organize the race it has promised but has done its best to kill. Of those taking part in last year's race Mors, Itala, Fiat and Opel have refused to sign the anti-racing agreement, and might all be induced to take part in the 1909 event. Add to these three cars from America, six from England, six from the smaller Italian firms which took part in the 130 millimeter Italian race of this year, nine from the smaller French firms not previously taking part in big races, and the figures would be so near the limit that somebody would be induced to complete the number. It is indeed declared that should the entries be only two or three short of the necessary number De Dion would come forth and fill the breach. The Marquis de Dion has been one of the stoutest opponents of racing, but is now of the opinion that, in view of the engagements taken and the promises made, the club cannot abandon its Grand Prix without losing all prestige.

## STRUGGLING WITH BRIARCLIFF TROPHY RULES

SUPPLYING satisfactory rules for a stock chassis race is a task that requires patience, ingenuity, and a conclusion in advance that the regulations will not be acceptable to all those who might care to participate. After the so-called "Committee of Automobile Manufacturers" had announced the rules drawn up last week, there was immediate objection from several quarters, protesting against a maximum bore of  $5\frac{1}{4}$  inches, minimum weight of 2,600 pounds, and minimum wheel base of 110 inches. It was immediately shown that these conditions made the event a high speed race and would compel concerns which had competed in the 1908 event to build special racing cars for the 1909 contest. So pronounced were the objections that the committee met again on Tuesday last at the clubhouse of the Automobile Club of America and continued in session the whole afternoon.

The final outcome was the announcement of new conditions providing for a maximum bore of  $4\frac{3}{8}$  inches and a maximum stroke of 6 inches for a four-cylinder engine, or, in other words, a total piston displacement of 403.15 cubic inches. The revised wheelbase minimum calls for 118 inches and the minimum weight is reduced to 2,300 pounds. Furthermore, the committee decided to ask the donor of the trophy, Walter W. Law, to agree to the changing of the conditions requiring that "the manufacturer of a car entered in the race shall have sold and delivered or have built and have had ready for delivery at least thirty days before the date of the contest in the year 1909 at least ten cars

similar in each and every respect to the car offered for entry."

It is predicted that Mr. Law, who is now en route home from Europe, will not agree to change the character of the race.

After the meeting the first entry was filed, it being that of Paul LaCroix, who nominated a Renault.

While in Kokomo the other day, John C. Wetmore interviewed Apperson Bros., who are quoted as follows:

"We do not believe that a satisfactory stock car definition can be evolved. Henry Ford, H. O. Smith, Walter Marmon, A. C. Newby, George A. Weidley and one of us spent ten days in trying to evolve a stock car definition for the A. A. A., and I don't think we succeeded very well. If we are to have races let us set a cylinder and a weight limit, and then let each maker build around them the best cars he can. These limitations, however, should be limitations suitable for the engines that are to be included in our regular stock cars. In a word, we should demonstrate in the big races the capability of the actual engine used in our stock cars. What bodies or running gear are used it is really immaterial, provided the outfit be within the weight limit. We favor engine and weight limitations for each class of standard car in, say, four distinct classes. For instance, class A might be  $5\frac{1}{2}$  by 5, class B,  $4\frac{1}{2}$  by 5, and so on down the line. The public, we repeat, wants a stock-car engine demonstration and not an exhibition of speed attained by engines not appearing in regular stock models."



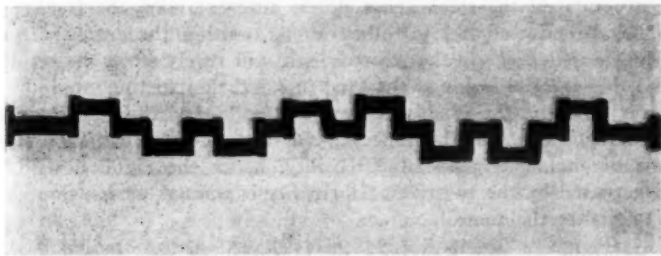
# AUTOMOBILE MOTOR CRANKSHAFTS DISCUSSED

By THOS. J. FAY, PRESIDENT SOCIETY OF AUTOMOBILE ENGINEERS.

AS a measure of the utility of steel, it is possible to devise a formula such as will serve to forecast (in a modest way) the probabilities. Such a forecast might be set down as follows:

$$U = \frac{\text{Tensile Strength} + \text{Elastic Limit} \times \text{Elongation}}{10^5} = \text{Utility.}$$

It is, of course, necessary to make all comparisons using test specimens of exactly the same dimensions in every case. The



An Eight-Cylinder Proposition in One Piece.

author prefers to use the "International Standard," the main dimensions of which may be set down as follows:

Between enlargements = 2 inches

Diameter enlargements = 1-2 inch

To show the working of the method, it will be the idea to establish the *U* value of the chrome nickel steel previously taken for comparison, thus:

$$U = \frac{150,000 + 130,000 \times 12}{10^5} = 33.6 \quad \left\{ \begin{array}{l} \text{A very low value,} \\ \text{due to heat treat-} \\ \text{ment of the steel.} \end{array} \right.$$

It is not the purpose here to set down in black and white the unqualified statement that high elongation is an absolute sign of kinetic ability irrespective of any other consideration. It is fair to say that the absence of this property is in the absence of kinetic ability.

Looking at the matter from another angle it is to say, Elastic Limit

— = the lowest possible value in the best possible steel.

Elongation

For the steel just taken this value would be as follows:

130,000

— = 10,833 which is a rather high value for the class of

12

steel represented, but the same class of steel is prone to go wrong in this direction; 5,000 would be a good value.

Take "carbon steel" and fix upon its "utility" factor "*U*" under changing conditions of the carbon content. To begin with, it will be necessary to fix upon the physical properties under the several conditions of the carbon content, which will be as follows:

## PROPERTIES OF ACID OPENHEARTH STEEL.

Points Carbon.	Tensile Strength.	Elastic Limit.	Elongation % in 2 Inches.	Utility Rating.
10	55,000	28,000	30	24.9
20	65,000	32,000	26	25.3
30	75,000	37,500	22	24.75
40	85,000	42,500	19	24.22
50	95,000	47,500	17	24.22

The figures taken were picked more or less at random from tests of carbon steel, which, however, does not debar their use for the intended illustration. What we find is that according to the method employed the value "*U*" is not changed (substantially) by changing the carbon content. Of course, by treatment the values are lowered when desired, but it can be shown that the "*U*" value will be nearly the same, irrespective of the changes, so long as the steel is not alloyed.

A genera of steel, then, has its own utility value, and if a greater value is desired it is necessary to alter the chemical

composition of the product. It will be possible to say that there are any number of cases in which the tests would show a substantial departure from the values as here given. This fact does not make the method wrong; indeed, it would show that some of the steel might be below the quality possible of attainment in good practice, or it might show an occasional test of steel better than can be expected in the general run of things.

In further proof of the accuracy of the scheme it is only necessary to compare the results attained by the usual manipulation of a given specimen of steel, such as the following:

The tests of a specimen of 44 points carbon steel show results as follows and the "*U*" values as calculated by the author show substantially constant for all, no matter what the treatment:

## STEEL IN THE NORMAL STATE.

Tensile strength in pounds per square inch.....	92,000
Elastic limit in pounds per square inch.....	36,000
Elongation .....	19%
Utility value .....	24.32

## WATER QUENCHED AT 850 C. AND ANNEALED AT 550 C.

Tensile strength in pounds per square inch.....	156,000
Elastic limit in pounds per square inch.....	92,700
Elongation .....	10%
Utility value .....	24.87

## OIL QUENCHED AT 850 C. AND ANNEALED AT 550 C.

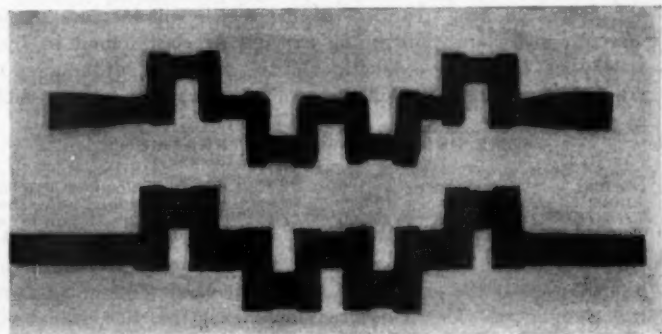
Tensile strength in pounds per square inch.....	126,000
Elastic limit in pounds per square inch.....	70,000
Elongation .....	13%
Utility value .....	25.48

It will be observed that this utility rating, or value, as it is termed for want of a better name, hangs to the carbon steel with great tenacity at or near *U* = 24. It is true, however, that very low and very high carbon contents are prone to influence the results.

There is one other point of moment to take into account, i.e., each genera of steel has its own figure of merit, such as ought to be reached, else it would be possible to say of the steel, it is not up to the customary standard of merit. These values can be set down about as follows:

- (1) Swedish iron ..... 34
- (2) Carbon steel ..... 24
- (3) Nickel steel ..... 34
- (4) Vanadium chrome steel ..... 44
- (5) Chrome nickel steel ..... 54
- (6) Special alloy steel ..... 64

(1) Swedish iron and some brands of English iron as "Farnley" are possessed of a higher "*U*" rating than any of



Showing Die Forging of Chrome Nickel Steel.

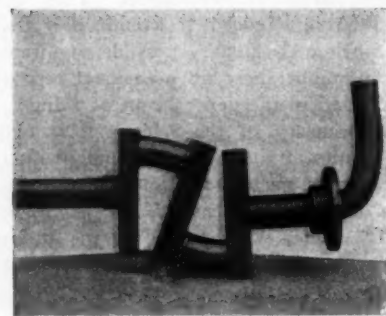
the grades of carbon steel. It is on this account, perhaps, that Lemoine and others were wont to use iron in automobile construction, be it said to their credit, with more than a little success.

(2) So variable in its character as not to lend confidence, either in the matter of fixing a rating or in the use of the steel, due entirely to the presence of carbon.

(3) A very stable rating in the grades of nickel steel holding a low carbon content, that is to say, with carbon below 16 points.

(4) Subject to considerable variation, especially if the carbon is somewhat high, or, in treated products.

(5) The author never found more than one grade of alloy steel in which the "U" rating reached the high value here given.



Double Opposed Krupp Steel  
Shaft after Test.

(6) The carbon content does not alter the rating materially, even considering wide variations of the same. Heat treating does not increase this rating over and above what it should be in well-fabricated normal steel. Heat treating, however, will readily decrease the rating. This will be possible for several reasons, as, over-heating, heating at too great a rate, or quenching

under mal conditions. If the material is not what it is supposed to be and the treatment is not therefore in accord with the requirements in view of the composition of the steel in fact, then it is assured that the rating, so called, will be altered. On the whole, however, it is to say, the rating will hold to a fairly constant value for any given genera of steel.

Without further reasoning we can reach these conclusions:

#### CRANKSHAFT STEEL.

- (a) Should have a low carbon content.
- (b) The tensile strength should be high.
- (c) The elongation should be high.
- (d) The "U" rating should be high.
- (e) The unit stresses should be low, very low indeed.
- (f) The elastic limit might be low without detriment if kinetic ability may not be reduced thereby.
- (g) The steel should be well fabricated.
- (h) The low carbon would indicate higher manganese and some alloying.

The general inference is that the tensile strength should be high and that the initial rigidity will be a maximum. The elongation should be high since kinetic ability might then reside in the steel. The elastic limit is not so important provided the unit stresses are established by designing at a very low point. Low carbon indicates ability to manipulate the steel without danger of destroying the good qualities of the same.

#### HEAT TREATMENT.

The desired heat treatment is that which will increase tensile strength and elongation at the expense of elastic limit in such a way as to improve kinetic ability, referring, of course, to crankshaft work. The following table shows that it is possible to do so:

#### SOME RESULTS OF HEAT TREATMENT.

Condition.	T. S.	E. L.	Ex.	Identification.
Normal.....	65,000	29,100	27.2	Manipulation of carbon
Annealed.....	67,000	40,000	30.9	steel in which the carbon
Treated.....	78,800	30,900	22.1	content was 16 points, as
Treated.....	71,900	25,300	27.8	reported by "Brinell."

An inspection of the test shows that the tensile strength can be increased at the expense of the elastic limit without affecting the elongation. The test also shows that the "U" value will not be diminished in the process below the customary point. The difference as between oil and water quenching, with subsequent reheating, was well illustrated in this case. Alloy steel if treated at the temperatures suitable for its qualities would be quite as or even more susceptible. Finally, it may not be too much to say the whole discussion rather goes to show that it is the mal use of steel that ends in disrupted crankshafts rather than a question of the materials to use. It is a fact, nevertheless, that very effective results might follow were the steel

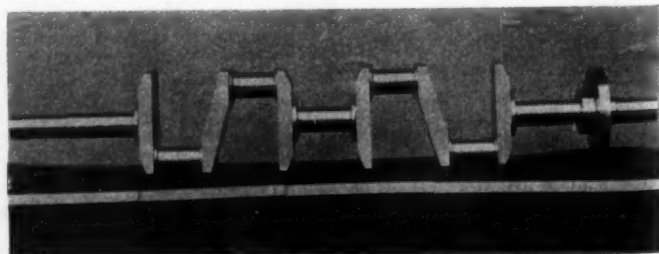
somewhat especially fabricated for the work, although it does not follow that the best steel for the purpose will necessarily have to be the hardest and the strongest steel.

There is one other point that can well be mentioned at this time. The advantages of heat-treating will be influenced by the shape and the manner in which the steel is handled. If the forgings are bruised in the process it will be quite out of the question to realize any very noteworthy results, no matter what the process may be. Then, again, there is the question of the shaping of the cheeks, that is to say, the manner in which the contour is effected. If crankshafts are cut from the solid they may be good, or bad, depending upon the question of the relation of the grain to the contour, if there is any indication of fiber in the structure of the steel. In a dozen different ways the treatment may be effected, as, for illustration, twisting the crankshaft to locate the cranks in the desired angle will surely effect the results, if the material is not of the kind to stand the twisting; moreover, very few are the grades of steel that will stand this twisting and not deteriorate in the process. On the other hand, if the steel is of the right grade, the tensility, hence the rigidity, will be increased by the twisting. If rigidity is wanted, this is one way to realize the same.

#### Relation of the Bearings to Material of the Crankshaft.

Discussion in relation to the question of the relative value of "plain" and ball or roller bearings is a matter that cannot well be advanced to any definite conclusion without considering the materials used in the crankshafts. In a word, if plain bearings are to be used the material of the crankshaft will have to be of the kind or in the condition such as will allow of the use of plain bearings. It is probably well understood that there is a great difference in the performance as between steel in the normal state and the same steel in some one of the several conditions in which it can reside. Pearlitic steel (steel in the pearlite state) is generally regarded as a poor material for use in bearings. All untreated steel, if the carbon content is below 90 points, is of the pearlitic genera and is not the best for bearing work. True, there is a considerable difference as between the various brands of pearlitic steel. For instance, a well-fabricated steel will serve better for a bearing than will the same steel not well fabricated.

Wootsite, or steel in the Marientistic state, may be far better for bearings of the plain type, but it must be remembered that these conditions are the product of a special heat treatment. This special heat treatment is not always afforded, and it is not always a fact that the crankshafts are in the best possible state. With ball or roller bearings these are not matters of moment since the "journal" portions of the crankshafts do not have to do bearing work. In other words, where the materials have to do special bearing duties they are heat treated to bring about the desired condition. If it is true that in ball bearings the steel has to be rendered as Wootsite to afford the desired results, then it is equally true that plain bearings should be rendered suitable. It is not the purpose here to maintain that any one of the intermediate conditions will best serve the purpose more than to say that for the best results in bearings the steel has to be heat treated, which involves a quench from some high temperature and subsequently the steel has to be "let down." It is some intermediate condition due to "letting down" or tempering that is sought in order that the steel will be in the



Balanced Four-Cylinder Crankshaft of Alloy Steel.



best possible condition to do bearing work. As before intimated, in ball or roller bearings this matter is attended to since they are heat treated and in them the material resides in the best state for bearing work.

#### Material in Crankshaft Should Be in a Different State.

These are all matters besides the question of the strength of the crankshaft and they are of even greater importance since a crankshaft is of no value at all if the bearings fail to work in a satisfactory manner. It is not uncommon to hear the statement made that the "Babbitt" lining in the bearing proper is of some wonderful grade that assures entire freedom from bearing troubles of every kind. There is nothing in such a statement unless the materials of the crankshaft (journals) are also suited to the purpose. Of course, it would be an unjustifiable expense to use such fine materials as go into ball bearings (of the grade that are used in crankshafts) for crankshafts and, again, such materials are not so good for the purpose under the conditions in which a crankshaft has to work as they are in ball-bearing work. It follows that the best combination is one involving the materials for crankshafts of a highly kinetic character and of great rigidity in combination with materials of the highest bearing qualities in the ball or roller bearings, the latter from the bearing point of view only.

It is a well-known fact that materials for ball or roller bear-

ings are not suitable for crankshaft work. It is equally well known that the ball or roller bearings are made of the best materials for the purpose. How, then, can the best possible results be realized without actually resorting to the use of the special bearings; that is to say, the ball or roller bearings. Without stating definitely the composition of materials for ball bearings, it is fair to say they take into account the carbon content at a point bordering upon free "cementite" with the steel in the normal state. Free cementite presupposes carbon above 90 points, and in such steel it is out of the question to consider the same as suitable for use in what are known as "machine members," in which the dynamic conditions are such as to include bending, sheering, and torsional moments. Statically, this material will serve very nicely, or, if the moments are as in a ball bearing, the results are very fine, as has been proved in practice.

Reducing the carbon reduces the ability of the balls and the races, and as a result it is plain that the materials that serve best for ball, and, roller bearings, are the least suited for crankshafts. Logically, then, the ball bearing crankshaft is something to take into account. The reason for this should be quite clear, since it enables the designer to use,

(a) Crankshaft materials of a highly kinetic character that is easy to work.

(b) Ball-bearing materials exactly suited to the work.

## INTIMACY OF THE RELATION OF TORQUE TO SPEED

CURIOUS as it may seem, it is not uncommon to hear autoists talk about the torque of their motors on a basis of the pressure that is due to "cold compression," not taking into account that the compression, in fact (under running conditions), is entirely at variance with the cold compression. The difference is generally considerable, and, unfortunately, the compression falls away as the speed of a motor is increased. In a general way, it will be possible to look at this important matter in the manner as follows:

Let

H.P. = the actual horsepower of the motor;

S = the angular velocity of the crankshaft, in r.p.m.;

P = pull in pounds;

R = radius of the lever-arm in feet;

$\pi$  = the ration of diameter to circumference;

$$\text{then, } P = \frac{H.P. \times 33,000}{2\pi RS} \quad (1)$$

$$\text{and, } S = \frac{H.P. \times 33,000}{2\pi RP} \quad (2)$$

$$H.P. = \frac{2\pi RSP}{33,000} \quad (3)$$

$$\pi = \frac{22}{7} \text{ nearly; } = 3.1416, \text{ nearly} \quad (4)$$

$$R = \frac{H.P. \times 33,000}{2\pi SP} \quad (5)$$

Considering a "prony" brake for testing purposes, if the arm of the same is 5 feet 3 inches long (balanced), it is then possible to simplify the formula (3) in a manner as follows:

$$H.P. = \frac{PS}{1,000} \quad (6)$$

The curve as here given is of a test using a brake (compensating) of the description in which the lever-arm was of the length as stated. An inspection of the curve will disclose not only the shape of the curve of torque, but the point at which the motor (in this case) delivered its maximum power. The best way, perhaps, to make the matter show up to excellent advantage, will be to give a tabulation of the results as follows:

$$(a) 1,000 \times 66 = 66,000 \div 1,000 = 66 \text{ horsepower.}$$

$$(b) 1,500 \times 58.5 = 87,750 \div 1,000 = 87.75 \text{ horsepower.}$$

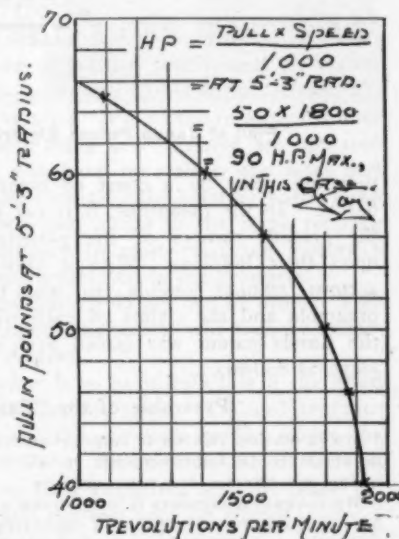
$$(c) 1,800 \times 50 = 90,000 \div 1,000 = 90 \text{ horsepower.}$$

In the actual test of this motor it was a fact that the motor did deliver slightly more power than the value given in the

line (c) at a speed somewhat above 1,800 r.p.m., but it is also true of this motor that at 1,900 r.p.m. the power fell away, showing that the limit of useful speed was reached. As will be seen, the power increased steadily, between 1,000 and 1,900 r.p.m., although it is also true that the torque decreased during all that period. On the other hand, the torque did not decrease in the same ratio as the speed increased, hence the increase in power.

The relation of torque to speed is desirable just so long as the speed will increase at a greater rate than the torque will decrease.

So long as this state of affairs can be maintained, just so long will the power continue to increase, thus increasing the "weight efficiency," which is the matter of great moment in work involving the automobile. Under such conditions it is only necessary to take into account the question of the stability of the motor, assuming a fair first cost, in dollars per horsepower rating, and not in dollars per pound of motor. When a motor delivers so much power that it depreciates too rapidly, then it is equal to saying that the weight efficiency is excessive. This condition can be due to bad material or inferior design in motors involving a good relation of torque to speed.



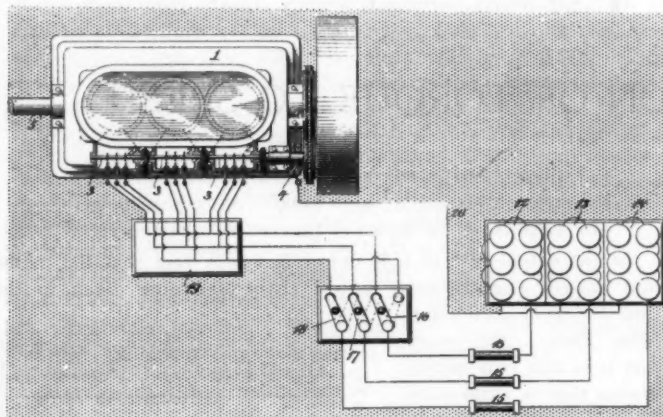
Relation of Torque to Speed in a Motor.

## DUAL IGNITION PATENTS CLAIMED BY APPERSON

ETERNALLY events repeat, and it is now claimed that the patent situation will take on exciting phases due to the presence of another "basic patent," or a patent with such broad claims as to give to the owners a monopoly in so far as dual ignition systems are concerned in conjunction with internal combustion motors such as are used in automobile work.

Elmer Apperson, of Apperson Bros.' Automobile Company, Kokomo, Ind., partially by acquiring the patent issued to F. E. Canda, January 17, 1899, and by taking out another patent in his own name, has built up what is claimed to be a strong situation. The Canda patent is No. 617,806, and the Apperson patent is No. 905,625, which later patent was issued December 1 this year. These patents, as the further information here given will show, relate to dual ignition systems as are in use on nearly every automobile on the market at the present time employing the double system.

To what extent this situation will complicate matters is a question that the future will have to decide, and as to the merits of the patents enough it is to say that they hold until



Plan of Canda Patent Electric Ignition System.

they are upset by a court of competent jurisdiction, and not before. In the meantime, it is not too much to anticipate that the present owners of the patents will endeavor to realize upon their holdings. With a view to showing, in the most accurate manner possible, just what these patents amount to, the preamble and the claims of each will be given in full. Since the Canda patent was issued first, it will be first exposed to view, as follows:

### Preamble of the "Canda" Patent.

My invention relates to improvements in gas and oil engines, and particularly to improvements in electric igniting and speed-regulating mechanism for such engines.

My invention consists in employing a plurality of igniting devices for each engine cylinder and operating, by preference, a plurality of such igniting devices during each working stroke of the cylinder, so as to insure the production of a spark by some one of the igniting devices during each working stroke; in providing separate circuits and batteries for the separate igniting devices of each engine cylinder and switches by which one or more of the batteries may be disconnected or connected with a different set of igniting devices from that to which it is ordinarily connected, thus making it possible to locate or bridge over any defect in the operation of the igniting mechanism which may occur during the operation of the engine; in so arranging the several igniting devices of each engine cylinder that ignition may be produced at different periods in the stroke, thus making it possible by throwing one or more of the igniting devices of each engine cylinder out of circuit to vary the speed of the engine, and in the novel combination, construction and arrangement of the parts.

The objects of my invention are, first, to provide an igniting mechanism which shall more certainly ignite the explosive charges of oil and gas engines than the igniting devices heretofore in use;

second, to provide means for locating defects in the operation of the igniting mechanism and for bridging over such defects without interfering with the operation of the engine; third, to provide simple means for varying the speed of the engine which may be operated at a distance from the engine.

In the drawings the invention is shown as applied to a three-cylinder vertical engine, but it may be applied to any single or multiple cylinder gas or oil engine of any type, and the particular igniting mechanism employed comprises a series of sparking contact-points, with means for bringing them together and separating them at proper intervals, and suitable circuits and electrical generators therefor.

In former gas or oil engines having electrical igniting devices trouble has been experienced through the occasional failure of the igniting device to cause ignition at the proper times. Entire failure of the igniting device to cause ignition continued for several successive strokes necessarily stops the engine, and the occasional failure of the igniting device to cause ignition at the beginning of a working stroke or ignition at too late a period in the stroke interferes greatly with the efficiency of operation of the engine and causes undesirable fluctuation in speed. As electrical igniting devices have been constructed heretofore it has been difficult to locate any defect in the operation of the igniting device or to bridge over the defect without stopping the engine or otherwise interfering with its operation. I have found that by employing a number of separate igniting devices for each engine cylinder the effectiveness of the whole igniting mechanism is very much increased.

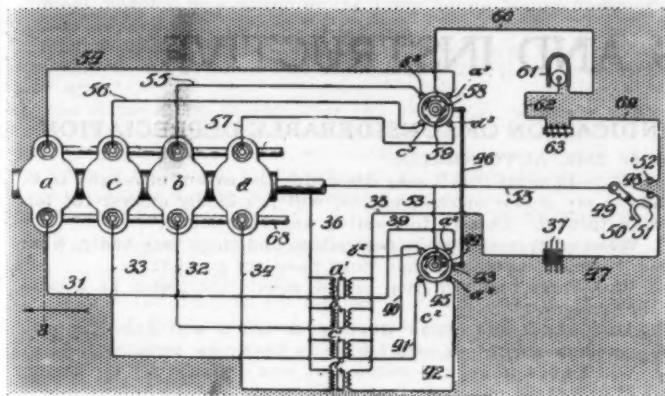
Considering the fact that any patent is as broad as its claims, it will be necessary to examine the claims of the "Canda" patent in order to ascertain the scope of the same. The Canda claims were stated in the grant of the patent as follows:

### Claims of the "Canda" Patent.

1. An igniting mechanism for the working cylinders of gas and oil engines, comprising a plurality of separate electrical igniting devices having separate circuits, means for supplying current thereto and means for throwing said igniting devices into and out of action, and for throwing each into action independently of the others, substantially as described.
2. An igniting mechanism for the working cylinders of gas and oil engines, comprising a plurality of separate electrical igniting devices having separate circuits, means for supplying current thereto, and switches in said circuits for throwing each igniting device into and out of action independently of the others, substantially as described.
3. An igniting mechanism for the working cylinders of gas and oil engines, comprising a plurality of separate electrical igniting devices having separate circuits and separate electrical generators, and switches in said circuits adapted to throw each igniting device into and out of circuit with its own generator and also into and out of circuit with the generator of a different igniting device, substantially as described.
4. A speed-regulating mechanism for gas and oil engines, comprising a plurality of separate electrical igniting devices, adapted to ignite the charges at different periods in the stroke, and means for throwing the several igniting devices into and out of action, at will, substantially as described.
5. In an internal-combustion engine, the combination with an engine cylinder, of a plurality of separate electrical igniting devices for said cylinder, set to ignite the charges at different periods in the stroke, and having separate circuits and separate electrical generators, and switches in said circuits adapted to throw each igniting device into and out of circuit with its own generator, and also into and out of circuit with a generator of a different igniting device, substantially as described.
6. In an electrical igniting mechanism for gas and oil engines, the combination, with a camshaft within the engine cylinder, a series of cams thereon and staggered with reference to each other, and means for rotating said shaft, of a series of movable pins opposite said cams, means for pressing said pins toward and against said cams, and means for limiting the motion of the pins, said pins being insulated from the cams except at the points of contact, substantially as described.

The Canda patent, in itself, does not seem to be all that would be required in order to establish the monopoly such as any "inventor" is entitled to if his invention is such as to breed an exclusive right. It will be necessary, then, to examine the Apperson patent in order to find the broad ground on





Apperson Patent Double Electric Ignition System.

which to establish the claims that are now being made by the present owner of the two patents. The declaration of the Apperson patent is as follows:

#### Preamble of the "Apperson" Patent.

My invention relates to explosion engines of the type used in automobiles, and has as an object the provision of means for overcoming the necessity of removing the ignition plugs from the cylinders to clean the contacts carried thereon when they become covered with oil, soot or other undesirable deposit.

It has heretofore been the practice to supply the cylinders of engines of the above type with one ignition plug, and it has been necessary to remove this plug and wipe or scrape the contacts carried thereon in order to clean them. In my present invention I provide two such plugs entering the explosion cavity of the cylinder at different points. I also provide two distinct electric circuits—one connected with each of the plugs, and means for using the circuits and plugs separately so that the plugs may be used alternately, whereby, when the ignition contacts upon one plug become coated with oil, so that the spark does not pass properly, the other plug may be thrown into use and the explosions occurring therefrom may be allowed to burn the oil or other deposit from the contacts of the plug just abandoned.

In carrying out my invention, I preferably use electric circuits of different character associated with the different plugs—that is, when used in connection with automobiles I prefer to connect one of the plugs with a battery circuit and the other with a magneto-generator circuit. I also preferably arrange these circuits so that they may both be used at once, as it may frequently occur in an engine comprising a plurality of cylinders that one of the plugs of one cylinder may become coated, while the opposite plug of

another cylinder may become coated, so that in order that all cylinders may explode properly, it is necessary to use both of the electric circuits at once.

My invention relates further to certain details of construction hereinafter described and shown in the accompanying drawings forming a part of this specification.

If the Apperson patent is as broad as its claims, which is the matter that will demand some attention, on the part of users of dual ignition systems, it will be a very interesting matter in the near course of events. The claims of the Apperson patent are as follows:

1. An explosion engine having a cylinder in which the explosive is adapted to ignite, a pair of spark plugs extending into the cylinder, a magneto, electrical connections from the magneto to one of the spark plugs, a battery, separate electrical connections from the battery to the second spark plug, and a switch for throwing the spark plugs into and out of operation.

2. An explosion engine having a cylinder in which the explosive is adapted to ignite, a pair of spark plugs extending into the cylinder, one of said spark plugs having a fixed spark gap, a magneto electrically connected with one of the spark plugs, a battery electrically connected with the other spark plug, a periodic circuit interrupter in the connection to the spark plug having the fixed gap, and means to control the connections to the spark plugs.

3. An explosion engine having an explosion chamber with two spark plugs therein, a magneto electrically connected with one spark plug, a battery electrically connected with the other spark plug, adjustable timers in the respective circuits, and means for adjusting the timers similarly and simultaneously.

4. An explosion engine having a cylinder in which the explosive is adapted to ignite, a pair of permanent spark gaps within said cylinder, a magneto electrically connected to the terminals of one spark gap, a battery electrically connected to the terminals of the other spark gap, and circuit interrupting devices in each of said connections.

5. An explosion engine having a cylinder in which the explosive is adapted to ignite, a pair of spark plugs extending into the cylinder, a magneto in circuit with one of said spark plugs, an induction coil having its secondary in circuit with the other spark plug, and a battery in circuit with primary of said induction coil.

Conclusions at this time would be futile. The whole matter will simply have to be threshed out in a businesslike way, or in the courts, if business acumen so dictates.

#### A ROTARY ENGINE, SAID TO BE WONDERFUL.

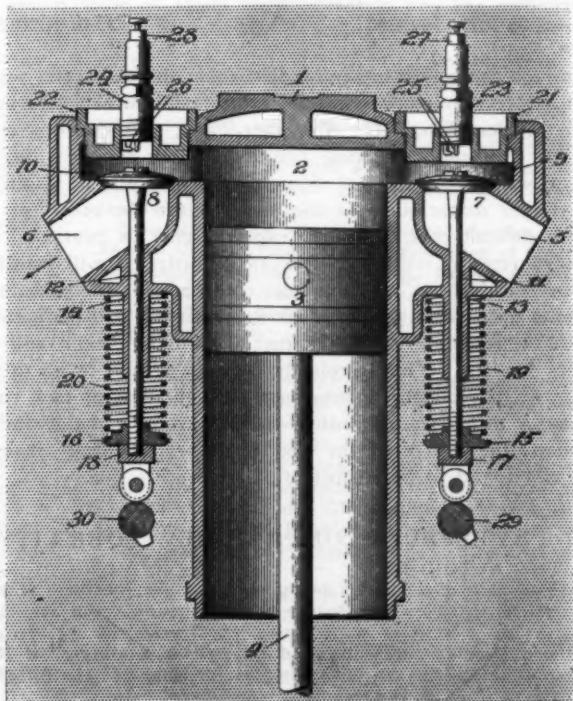
PITTSBURG, Dec. 21.—A new engine for which some big claims are made has been invented by Newell O. Allyn, of Hiram, O., formerly with Packard and Winton. It is of the rotating cylinder type, four air-cooled cylinders being used. These are operated on the two-cycle principle and have no valves, the inlet and outlet ports being opened and closed by the rotating part of the machine. No flywheel is provided owing to the large rotating mass of the cylinders. Contrary to most revolving motors a muffler is provided and somehow attached to the cylinders.

It is stated that there is no battery to get out of order. This may be, but a more complicated mechanism will then be necessary to supply the ignition current.

This "wonderful new" motor is to be installed in a car fitted with a sliding gear transmission; the engine is placed in front under the customary hood and the gas tank carried under the front seat. A company, the Valley Automobile Co., of Warren, O., with \$200,000 capital, has been organized and the plant for manufacturing this engine and car will soon be started.

The claims for the engine are light weight, simplicity, strength and graceful appearance. From the scant description at hand it is hard to see any point in this motor not already well covered by such sterling machines as the Adams Farwell five and seven cylinder rotating engine or the Torbensen three and four cylinder rotating motor.

**Colors Show Temper of Horses.**—An automobile authority, who has made a study of horses, is authority for the statement that sorrels are the only absolutely safe horses, white animals, on the other hand, always being dangerous. Between these two extremes comes the bays and the blacks, the former being the better natured of the two. Automobile drivers will save themselves lots of trouble by remembering this point and driving very carefully past a white horse.



Cross Section of the Apperson Dual Ignition.

## LETTERS INTERESTING AND INSTRUCTIVE

### TANKS FOR CARBONIC ACID TIRE INFLATERS.

Editor THE AUTOMOBILE:

[1,684.]—If carbonic acid is used in the inflation of tires and in view of the high pressure that obtains with the same in the liquid state the question arises as to the safety of the same especially if it is exposed to the direct sun's rays on a hot Summer day in the South. What can be said about this phase of what would be regarded as a serious matter in other zones of activity? P. B. New York City.

True, the pressure is high. Equally true the containers must be designed to withstand the pressure, and it is well not to expose the same to more heat than that normal to the surroundings. That the vendors of this gas for any purpose are interested in rendering its use safe, is a matter that can be taken for granted. On a basis of 120 degrees Fahrenheit, according to Reid T. Stewart, in his paper on "The Physical Properties of Carbonic Acid," A. S. M. E., December, 1908, meeting, among other statements, it was said, the walls of a tank, 6 inches outside diameter, should be 0.2514 inches. This is on a basis of 18,000 pounds per square inch extreme fiber strain.

The pressure exerted by carbonic acid on the walls of a cylinder will depend upon the density of the acid and the temperature. At 120 degrees Fahrenheit, and a density of 0.61, the pressure will be 1,760 pounds per square inch, according to the same authority. The thickness given is the minimum, considering the use of material of such physical properties as will allow of a fiber strain as given without eating into the reasonable factor of safety that should obtain in a case of this sort.

### THE RELATION OF POUNDS TO KILOGRAMS.

Editor THE AUTOMOBILE:

[1,685.]—In connection with racing in particular, it is, more often, than not, that the weight of cars will be referred to in kilograms. What is the easiest way to reduce these units to English? New York City. YANK.

Use the formulas as follows:

$$\text{lbs.} = \frac{75 \times \text{Kg}}{34}$$

hence:

$$\text{Kg.} = \frac{34 \times \text{lbs.}}{75}$$

Example:

If a racing car is to weigh not more than 2,204 pounds, what will be the equivalent weight in kilograms?

$$\text{Kg.} = \frac{34 \times 2,204}{75} = 1,000 \text{ kilograms (in round numbers)}$$

and

$$\text{lbs.} = \frac{75 \times \text{Kg.}}{34} = 2,204$$

### REQUIREMENTS FOR A CAR ENTERING CANADA.

Editor THE AUTOMOBILE:

[1,686.]—I am contemplating a tour East next Summer, and would like to know, if I should return by the way of Niagara Falls and through Canada to Detroit, if I will have any trouble with customs at Niagara Falls or Detroit? W. HILLMAN. Waterloo, Ia.

If you become a member of the Automobile Club of Buffalo, upon presentation of a membership card, you will be able to spend three days in Canada, without any other formality. Otherwise, to conform to the "custom" requirements will be necessary. Briefly, you will have to deposit \$25 and put up a bond double the estimated duty on the car. The forms in force at the Custom House must be used and you should produce a bill of sale, showing the purchase price of the car. The more clearly you present your case, the less trouble you will have. For further information, see "The Automobile Official Blue Book," section 1.

### INDICATION OF CONSIDERABLE DEPRECIATION.

Editor THE AUTOMOBILE:

[1,687.]—In order that I may determine the extent of repairs to be made to my double opposed engine, will you kindly answer the following through "Letters Interesting and Instructive."

1. When compression leaks past piston and rings very badly, what does it signify, assuming that rings have not turned?
2. With rings removed from piston, should the piston be a close fit in cylinders?
3. How can I determine whether or not I will have to have the cylinders rebored in case I have to have new pistons?
4. Will I have to get the piston that was designed for the motor, or will any other piston do that will fit?
5. With both rear wheels jacked up and a pull exerted on the left rear wheel, there isn't any lost motion between wheel and differential; they both act as a unit. But with the right rear wheel when pulled there is quite a lot of play, say about an inch on the circumference of the wheel, before the power is applied to the differential. Is this condition right? NEW OWNER. South Braintree, Mass.

1. Loss of compression, which, in turn, means loss of power, is the first answer.
2. In reply to the second question. No. The piston becomes hotter than the cylinder, because the cylinder is artificially cooled and the piston is not. The hotter piston will expand the most, and, as a consequence, it will stick, if there is not a difference.
3. "Size" the cylinders. If they are out of round, they should be rebored.
4. It is best to get pistons such as were designed for the motor, if they proved to be valuable for the purpose. If you find that the design is not good, then it will be time to experiment.
5. The rear axle seems to be in need of overhauling. The condition is not right. It is not much of a job to take it apart and see just what is at the bottom of the trouble.

### CERTAIN CAUSES OF LACK OF POWER.

Editor THE AUTOMOBILE:

[1,688.]—I have a two-cylinder Ford, Model T, which I bought second-hand. It runs fairly well, but it will not develop much power with the throttle wide open. The compression is poor. It cranks easily. The best authority here says it needs new pistons. Is it likely he is right? Or is it probable that new piston rings would be sufficient? Is it possible that it would be best to get new cylinders and new pistons? What might be other causes for its having so little power? J. B. NEILL. Pecos, Tex.

What you say would seem to indicate that the carbureter wants attention. If the compression is diminished, you can determine the fact by cranking. On the other hand, you cannot expect to realize "difficult" cranking (due to a high compression) in a motor with cylinders less than 4 inches bore. To "spin" a four-cylinder motor, such as the one you are the possessor of, is not a difficult task, and the "experts" may be mistaken. If your carbureter is not in good working order, it will manifest itself by "dead points" in the range of speed. If the carbureter is in good order, then you can look to the timing and the battery. A good (energetic) spark at the propitious instant will do wonders for you. There probably is small reason to go to the expense of new pistons, in any case; the question of new rings is a matter to be taken up when the carbureter and the timing, as well as the source of the electric energy, are fully investigated, and found to be competent.

### MADE BY SIMPLEX COMPANY, NEW YORK CITY.

Editor THE AUTOMOBILE:

[1,689.]—I have a complaint to make and some questions to ask. The questions will help explain the complaint, and I will ask them first.

1. Whose Simplex car is handled by Palmer & Singer, of New York and Chicago—the Sheffield Simplex, of England; the Simplex, of Mishawaka, Ind., or the Simplex made where?
2. What (I. e., maker) Simplex car won the second Brighton Beach 24-hour (Robertson-Lescault)?



3. What Simplex was victor in the Long Island Motor Parkway Sweepstakes, Lescault driving?

4. What Simplex (Seymour) stood about eleventh in the Thanksgiving Day Grand Prize race at Savannah? Was it the two-cycle car or what?

5. Was it the \$1,000 Buicks (formerly \$900) that were driven by Hearne, Easter and Jeffers in the light-car race at Savannah?

You, in common with other automobile papers, do not give sufficient details pertaining to the cars and the manufacturers participating in various events in this country and abroad.

La Fayette, Ind.

A SUBSCRIBER.

1. The Simplex product handled by the Palmer & Singer Mfg. Co. is manufactured in New York.

2. It was the Simplex of Palmer & Singer that participated in the second Brighton Beach 24-hour race, which event it won with 1174 miles to its credit, thus establishing a new American competition record.

3. Again it was a P. & S. Simplex stock car which scored in the Parkway Sweepstakes.

4. The P. & S. Simplex at Savannah was the same one which proved a winner in the 24-hour race.

5. Perhaps the Buick company might care to answer.

### CONSIDERABLE FLEXIBILITY IS AIMED AT.

Editor THE AUTOMOBILE:

[1,690.]—What is the advantage of having universal or cardan joints on each side of the differential; also the arched axle and dished wheels as on the Peerless? Is it a fact that carbureters having the float chamber set to one side of the spray jet give trouble going around corners and up hills? Are valves-in-head engines, with both valves actuated by one double acting cam, considered an entire success?

L. PIPER.

Marysville, O.

If the axle is arched, the spokes of the wheels will be "plumb," presupposing a camber in the road. The Peerless construction is such as to enable the car to negotiate roads in which the usual camber is to be taken into account, and also tires are thus enabled to take the load fairly. There are other matters that could be taken into account in this connection, as the workmanship in general of the same axle. Obviously the universals, in the absence of good practice in other ways, in an axle would be of

no great avail. If "float chambers" set to one side, as you say, give trouble, it would seem to follow that it is not good practice to do curves at high speed.

Your question as it is put is not fair to the scheme of valves you refer to. There is a certain amount of trouble about or in connection with every mechanical device that man ever turned out. To say, then, that there is to be no trouble with any one scheme, is to be a little farfetched. The fact that the scheme is in vogue, at the instance of builders of repute, coupled with the fact that its use is continued, is good assurance of commercial success. In point of theory it is an excellent idea.

### HERE'S A KICK FROM MILWAUKEE.

Editor THE AUTOMOBILE:

[1,691.]—In your issue of December 10, under the head of "News in General," there is a paragraph entitled "Another Triumph for Locomobile." After attributing to Pabst the honor of having made Milwaukee famous instead of to Schlitz, who was the originator of that phrase, you proceed to make some very peculiar statements. While we are willing that our competitors shall have all the glory that belongs to them, that "to him that hath shall be given," so that more shekels may be poured into the coffers of Jeffries, we hardly think it right that an infant industry like ourselves should be robbed of the credit of having sold to the board of school directors a car. Then you say that the board of public works is about to choose a car. Well, what for? Not for themselves. Then you speak of the common council appropriating \$4,600 for a police-car. So far you are right, and you are also right when you say that the chief wants a Locomobile, but the whole bunch has been trying to pretend that there was competition. At present we have an injunction against the board of public works and the chief of police, demanding that the automobile shall be bought upon specifications, advertisement and lowest bidder, like other material and supplies. You also are giving the Locomobile very great credit for track races in Milwaukee. Did you know that in the last track race it used up forty tires in twenty-four hours? Do you call this an endurance run or a non-endurance run if \$1,600 worth of tires is the price of a merry-go-round victory? JOHNSON SERVICE COMPANY.

Milwaukee, Wis.

W. S. Johnson, President.

P. S.—Since the above was written the real estate board of this city has passed a resolution requesting all city departments to purchase automobiles made wholly or in part in the city of Milwaukee where such purchase is consistent with good work.

## THE AUTOMOBILE CALENDAR

### AMERICAN.

#### Shows and Meetings.

- Dec. 31-Jan. 7.—New York City, Grand Central Palace, Ninth Annual Automobile Show, conducted by the American Motor Car Manufacturers' Association, with Exhibits by the Importers' Automobile Salon, Inc., Alfred Reeves, General Manager, 29 West 42d Street.
- Jan. 5.—New York City, Fourth Annual Meeting Society of Automobile Engineers. (Will adjourn until January 19 after opening session.)
- Jan. 16-23.—New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers. M. L. Downs, Secretary, 7 West 42d St., New York City.
- Jan. 27-Feb. 3.—Philadelphia, Second Regiment Armory, Eighth Annual Show, Philadelphia Automobile Trade Association.
- Feb. 6-13.—Chicago Coliseum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. S. A. Miles, Manager, 7 East 42d St., New York.
- Feb. 15-20.—St. Louis, New Coliseum Building, Third Annual Show, St. Louis Automobile Manufacturers' and Dealers' Association. Lloyd Rickert, Manager.
- Feb. 15-20.—Detroit, Wayne Pavilion, Annual Show, Detroit Automobile Dealers' Association. E. LeRoy Peltier, Manager.
- Feb. 15-20.—Cleveland, First Regiment Armory, Annual Show, Cleveland Automobile Dealers' Company.
- Feb. 16-18.—Denver, Col., Auditorium, First Annual Automobile Show, Denver Motor Club.
- Feb. 18-25.—Toronto, St. Lawrence Arena, Third Annual National Automobile, Motor Boat and Sportsmen's Exhibition. Ontario Motor League. R. M. Jaffray, Manager.

- Mar. 1-6.—Buffalo, Convention Hall, Seventh Annual Automobile Show. Buffalo Automobile Trade Association. Dal H. Lewis, Secretary.
- Mar. 6-13.—Boston, Mechanics Building, Seventh Annual Automobile Show, Boston Automobile Dealers' Association. C. I. Campbell, Manager, 5 Park Square.
- Mar. 27-Apr. 3.—Pittsburg, Duquesne Garden, Automobile Show, Pittsburg Automobile Dealers' Association.

#### Races, Hill-Climbs, Etc.

- Jan. 1-2.—Philadelphia, Two-day New Year's Run of the Quaker City Motor Club.
- Feb. 20-22.—New Orleans, Fair Grounds Track, Mardi Gras Race Meet, New Orleans Automobile Club. Henry George, Secretary.
- March 5-12.—Palm Beach, Fla., Lake Worth, Fifth Annual Regatta, Palm Beach Power Boat Association.

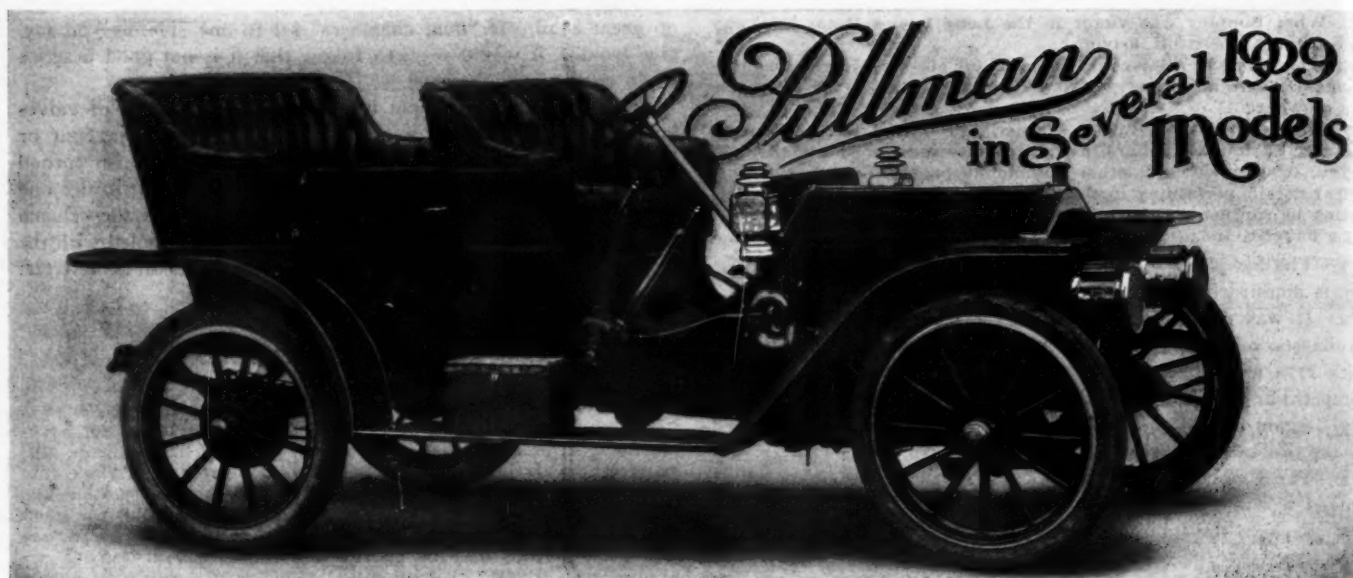
### FOREIGN.

#### Shows.

- Jan. 16-25.—Belgium, Brussels Automobile Exhibition.

#### Races, Hill-Climbs, Etc.

- May 2.—Sicily, Targa Florio, Automobile Club of Italy.
- May 26.—Russia, Moscow—St. Petersburg Race.
- June 10-18.—Germany, Prince Henry Cup Competition.
- June 14-19.—Scotland, Scottish Reliability Trials.
- July 1-3.—France, Angers Course, Grand Prix, Automobile Club of France.
- July 13-17.—Belgium, Ostend Automobile Race Week.
- Sept. 5.—France, Mont Ventoux Hill Climb.
- Sept. 11-19.—Italy, Bologna, Florio Cup Race, Automobile Club of Bologna.



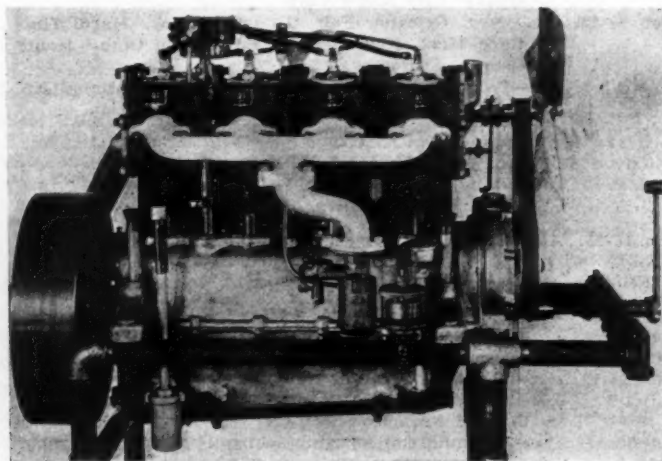
Five-Passenger Touring Type Pullman for 1909, as Seen from the Operating Side.

IN order to be in a position to supply as widely varying a demand as possible, the York Motor Car Company, York, Pa., will list no less than four different chassis for the 1909 season, each of which will be made in several body types so that the range of Pullman cars will be very extended. At the lower end of this list is the new Model L, 20-horsepower runabout; next comes the Model K, 30-horsepower light touring car, while a six-cylinder car of the same power is to be known as the Pullman Model 6-30. Above this where power is concerned is the Model 4-40, which, as its name indicates, is a four-cylinder car of 40 horsepower. This title, however, only applies to it as a gentleman's roadster, as in a seven-passenger type of touring car, it is known as Model M.

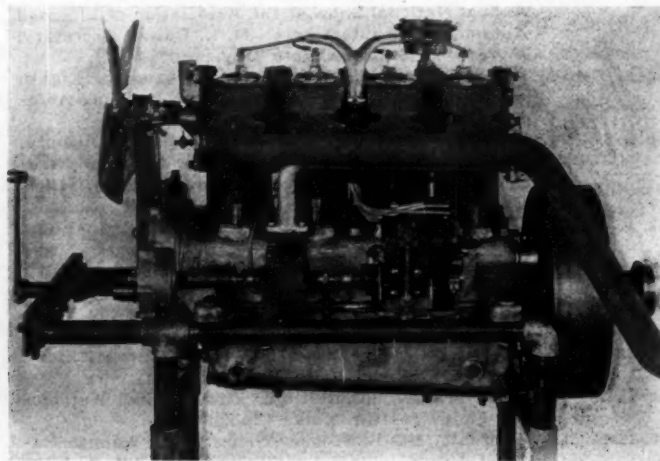
**Motor Design.**—Taking what may best be termed the "baby" Pullman first, otherwise the Model L runabout, its cylinder dimensions are 3 3/4-inch bore by the same length of stroke, while its rating is 20 horsepower, with a speed range of from 200 to 2,000 r.p.m., though its nominal capacity is developed at a moderate speed, namely, 1,000 r.p.m., and it is naturally capable of exceeding this power output to a considerable extent. Like its larger confrères of the Pullman line, the cylinders are cast separately. The Model K, 30-horsepower type, has 4 1/2-inch "square" cylinders, its speed range extending from 150 r.p.m. to 1,800 r.p.m., while its output is delivered at the moderate normal speed of 900 r.p.m. The same cylinder castings as are employed on the Model L, 20-horsepower runabout are also utilized as the foundation of the power plant of the Model 6-30, while in the case of the 4-40 the cylinder dimensions are 5-inch bore by

5 1/4-inch stroke, its rating also being delivered at 900 r.p.m. As the same features of design and construction that have characterized the Pullman motors during the past year are perpetuated in these new models, it will be evident that a description of the features of one is applicable to the others, so far as the motor itself is concerned, its accessories, such as the magneto in particular, depending more upon the list price of the car. For instance, the cylinders are cast separately in every case, while on the Model L and the Model 6-30 Pullman, the valves are all on the same side; in the case of the Model 4-40 and the Model M, the valves are oppositely disposed in outboard valve ports and are interchangeable. The cylinder heads and waterjackets are cast integral in every case, an interesting feature of the Pullman motor, being the manner in which the independent castings are joined together by means of special fastenings between them, thus throwing the waterjackets of all four cylinders into one.

**Chassis Specifications.**—Standard practise has nowhere been departed from. The remaining specifications of the Model L, 20-horsepower car are pressed steel frame of the usual channel section, with a substantial subframe carrying the engine and transmission, Timken rear axle, single-piece drop-forged I-beam, front axle; jump-spark ignition through a single vibrator coil and distributor fed by a set of storage cells; lubrication by means of a new self-contained system, a positive oil level being maintained by a valve adjustment. The gear-set housing is packed with lubricant and grease cups are provided wherever necessary. A standard type of leather-faced cone clutch using cork



Pullman Power Plant Viewed from Carburetor Side.



Fan Pump and Magneto Drive of the Pullman Motor.

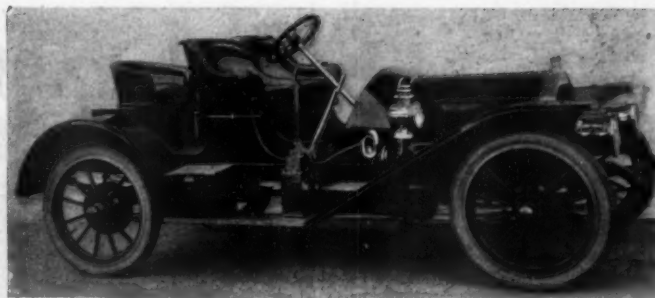


inserts is employed in connection with a three-speed gear-set operating on the selective principle of shifting, the shafts of the latter being carried on Hess-Bright annular ball bearings, while the Timken roller bearings are used in the wheels. The suspension consists of semi-elliptic springs front and rear, the former measuring 40 by 2 inches, while the latter are 48 by 2 inches. The wheelbase is 102 inches, the tread standard and the clearance 10 inches, while the car weighs 1,750 pounds. With the usual equipment, including two acetylene headlights, the car lists at \$1,500.

**Model K**, 30-horsepower Pullman is a machine that comes between the other two four-cylinder types, the Model L, 20-horsepower, and the Model 4-40, so far as power is concerned, it will doubtless constitute one of the most popular of the Pullman models, and will accordingly be listed as a five-passenger light touring car, a roadster and with a toy tonneau. On a larger scale, corresponding to its increased power, the specifications of the chassis are practically the same as those already given in the case of the 20-horsepower car, namely, pressed steel frame, with a subframe for the motor and transmission support, drop-forged one-piece I-beam front axle, semi-elliptic springs all round, the dimensions in this case being 40 by 2 inches front and 50 by 2 inches rear. The wheels are 34 inches instead of the 32 by 3 1-2-inch size used all round on the smaller car, while the tire equipment consists of 3 1-2-inch front and 4-inch rear tires. For ignition a Bosch high-tension magneto forms a regular part of the standard equipment. The same type of three-speed selective gear-set is employed, the gears and shafts being of chrome-nickel steel, while the latter are supported on Hess-Bright imported ball bearings, the latter being used throughout the car, with the exception of the motor. Nickel steel shafts and gears are employed in the rear axle, which is made with pressed steel housings and is held in alignment by means of a V-type torsion rod.

Dual ignition is regularly fitted on this car, the emergency system consisting of a single vibrator coil on the dash and a high-tension distributor. So far as the other accessories are concerned, the same self-contained oiling system, made integral with the motor, is a feature of this, as it is of the other Pullman motors, and this is likewise true of the special float-feed carbureter. The wheelbase is 106 inches and the tread standard, while the weight all on, is 2,250 pounds. In complete running order with the usual equipment of acetylene headlights, sidelights, etc., the car lists at \$2,000.

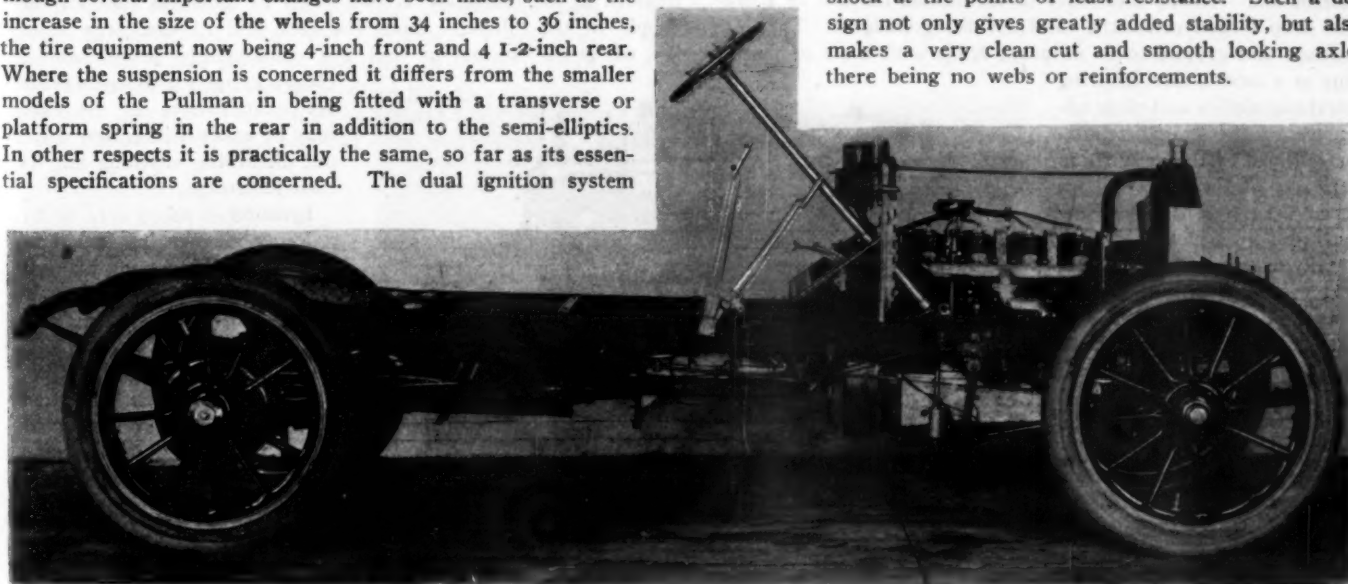
**Model M** has been designed especially to meet the wants of the purchaser of a seven-passenger touring car, the chassis being practically the same as the 40-horsepower Pullman of 1908, though several important changes have been made, such as the increase in the size of the wheels from 34 inches to 36 inches, the tire equipment now being 4-inch front and 4 1-2-inch rear. Where the suspension is concerned it differs from the smaller models of the Pullman in being fitted with a transverse or platform spring in the rear in addition to the semi-elliptics. In other respects it is practically the same, so far as its essential specifications are concerned. The dual ignition system



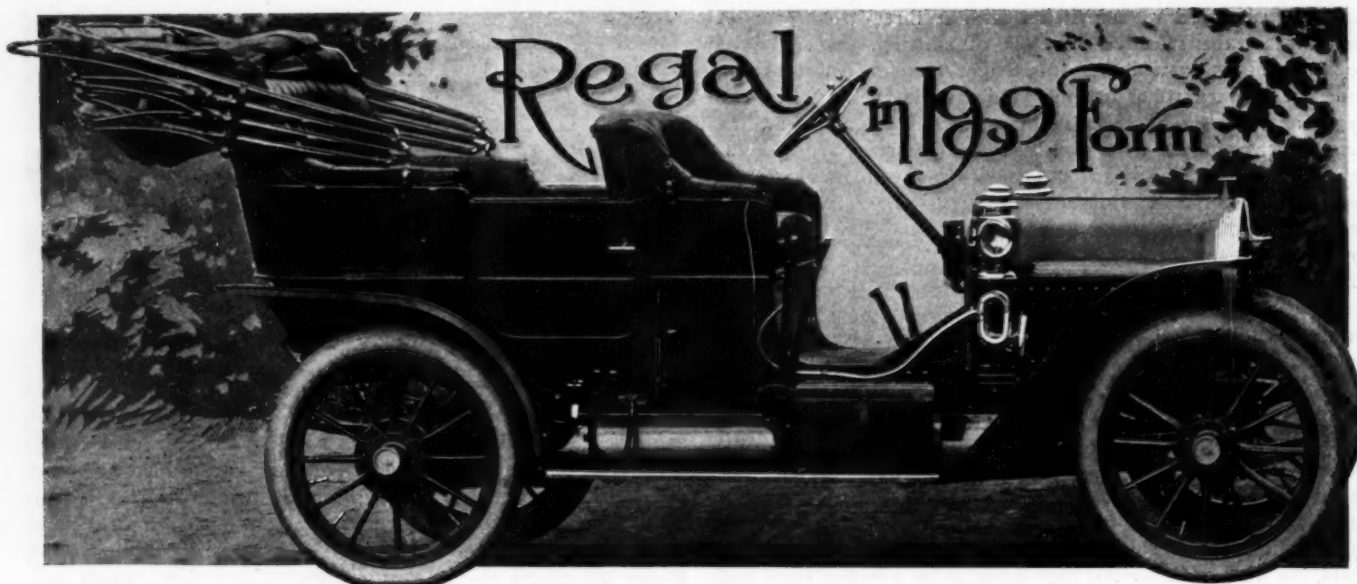
One of the Pullman Three-Seaters for 1909.

consists of a Bosch high-tension magneto and a synchronized single-coil and distributor supplied by storage cells; a three-speed selective gear-set is employed, Hess-Bright annular ball bearings being used here as well as in the remainder of the car. The front axle is a one-piece I-beam drop-forging, while the rear axle is of the floating type made by Timken with a pressed steel housing. In the case of the Model K, 30-horsepower Pullman two brakes are placed on the rear wheels, while a third, which constitutes the emergency, is placed on the transmission shaft, while on the Model M, 40-horsepower car, both sets of brakes are placed on the driving wheels. The wheelbase is 119 inches and the tread standard, the car having a clearance of 10 1-4 inches. The weight all on is 3,100 pounds and the list \$3,500. As a runabout the same chassis is slightly altered to make the Model 4-40, which lists at \$3,000, the same as last year.

One of the distinguishing features of the Pullman car is the use of the Timken rear axle unit, which represents a great advance over the usual design for this essential. One of the great troubles with the present form of built-up axle is that it requires a truss to brace and stiffen it, and, as it is more or less difficult to keep the members of the truss under tension, this constitutes an element of weakness. The Timken Company in manufacturing this new axle have taken advantage of the fact that tubular forms give great strength, while the resistance is distributed proportionally to the points of greatest stress by grading the thickness of the metal so that the heaviest parts are at the spring seats where the strains are greatest, and the thin parts are at the center. The axle has been so designed as to carry the load without the necessity of trussing, a pressed one-piece housing of a special grade of basic open-hearth steel of high static resistance being employed. In the design of this axle, sharp curves have been entirely eliminated, thus avoiding any angles which would tend to add leverage and increase the liability of shock at the points of least resistance. Such a design not only gives greatly added stability, but also makes a very clean cut and smooth looking axle, there being no webs or reinforcements.



Side View of the Pullman Chassis Illustrating Its Well Balanced Outline.



By CHARLES B. HAYWARD.

**D**ETROIT, Dec. 21.—Upon reviewing the specifications of the Regal car for the 1909 season, with the subject of the inspection before one, the conclusion that the makers' efforts to combine the best features of standard practice in a machine selling at a low figure have been very successful is inevitable. And it is further substantiated by an inspection of the manner in which the work is being carried out in the Regal factory, for the best of materials and design would be of doubtful value when handicapped by poor workmanship. As a matter of fact, it was the original intention of the Regal Motor Car Company to place its product on the market at a higher price, but it was found possible by means of multiple production on an extended scale to reduce the figure to \$1,250, at which the Regal now lists. But for the delay in perfecting a factory organization, a large number of the Regal cars would have been placed on the market during the past season. Shipments of the new model began about a fortnight ago, and with greatly increased manufacturing facilities, it is the intention of the makers to market as many cars as it is possible to turn out, though it it planned to make 2,000.

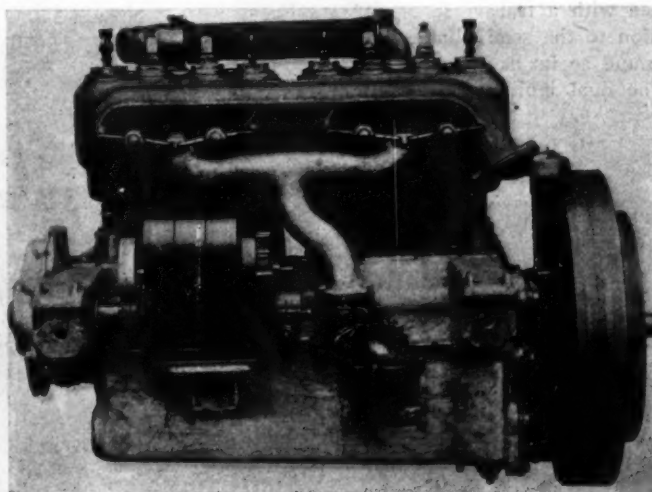
**Some Motor Specifications.**—In the details of the design of the power plant and its accessories particularly are to be found a number of features ordinarily confined to much higher-priced construction. Among these may be mentioned the use of a one-piece drop-forged camshaft, the cams being integral. They are hardened and ground to an accurate finish with a set of master cams as a model, thus insuring interchangeability and close adherence to the timing regulation outlined by the designer in every one of the many motors turned out. The cylinders measure 4 by 4 inches and are liberally water-jacketed, water being provided for between the valves. Large openings are provided in the cylinder heads, these being covered with plates carrying the cooling water outlets. Circulation is on the thermo-syphon principle, the outlets from the cylinder heads measuring 1 1/2 inches in diameter, while the connection from the lower portion of the radiator to the jackets measures 2 inches, deflected plates

being employed to spread the incoming cold water. The hot-water outlet takes the form of a Y, the water being discharged into the tank portion of the radiator, thus condensing any vapor formed and effectively preventing steam pockets.

All valves are placed on the same side, the push rods being equipped with roller ends, while the valves themselves are of large diameter, so that in connection with well-worked-out manifolds, an easy flow of gas is provided for. Main bearings are of liberal size of die-cast babbit, while drop-forged connecting rods are employed. Helical timing gears enclosed in an aluminum housing make for silent running, the oil pan also being of this material, while the engine base is of cast iron. The lubricating system itself is particularly noteworthy. It is of the constant circulating type, consisting of a small gear pump, placed at the lower rear right-hand corner of the oil pan, from which it takes its supply. From the latter the oil is raised and discharged into a copper tube of liberal dimensions running the entire length of the crankcase and parallel with the crankshaft at about the same height as the journals of the latter. Holes are drilled in this tube at intervals to correspond with the various bearings, and when the pump is in action oil is spurted on each of them in liberal quantities, splash being depended upon to lubricate the piston and wrist-pin. Small brass petcocks are inserted in the crankcase at two levels to show the state of the supply in the oil pan. Both the tube and its discharge holes are of large dimensions and are consequently proof against

clogging, but provision is made for examination, as the tube may be easily withdrawn without disturbing anything but its own fastenings.

Ignition is taken care of by a Remy magneto of the high-tension type employing a single coil, the latter being mounted on the dash. Experience with this installation has shown that there is no necessity of using batteries for starting, but an emergency system consisting of a set of dry cells operating the same spark plugs through the distributor of the magneto has been provided. The remaining accessories consist of a Buffalo carburetor and a McCord radiator of attractive design.

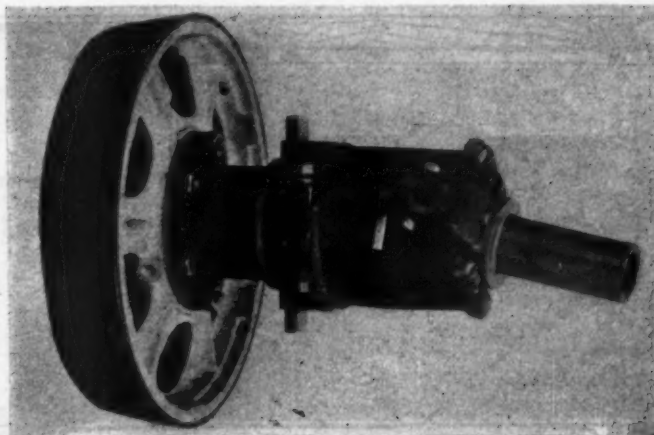


Regal Power Plant Shows Simplicity and Compactness.

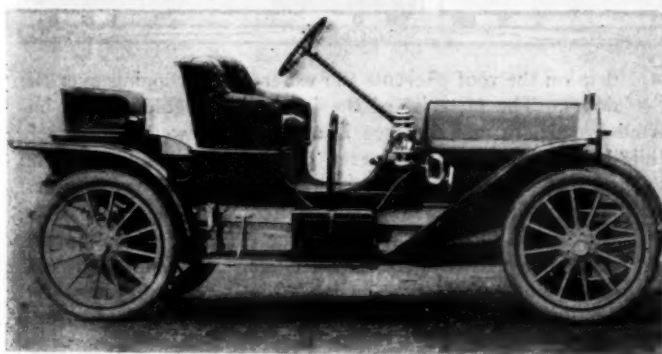


**Clutch and Drive.**—Standard practice has been adhered to in the conical leather-faced clutch, but here again the effort to provide the best of its kind, regardless of the selling price, is evident in the detail of the design. The engaging spring is of the self-contained type, thus avoiding thrust, while flat springs are placed beneath the leather facing to insure gradual engagement. Lubrication is taken care of by packing the clutch spring housing full of grease. Two universals, one of which combines a telescopic joint, are employed on the propeller shaft, extending from the clutch to the combined change speed gear and drive on the rear axle, the angle of the shaft being such that the drive is practically a straight line when the car is carrying its normal load.

A short distance back of the clutch is placed a transverse pressed steel member riveted to the sides of the frame. This serves as the forward support of the tubular torsion rod, surrounding the propeller shaft. The double universal at this end is of the cross-pin type, the pins measuring 1 inch in diameter, while liberal bearing surfaces are allowed. The whole is enclosed in a babbitted malleable iron housing. The rear axle



Regal Cone Clutch and Double Universal.



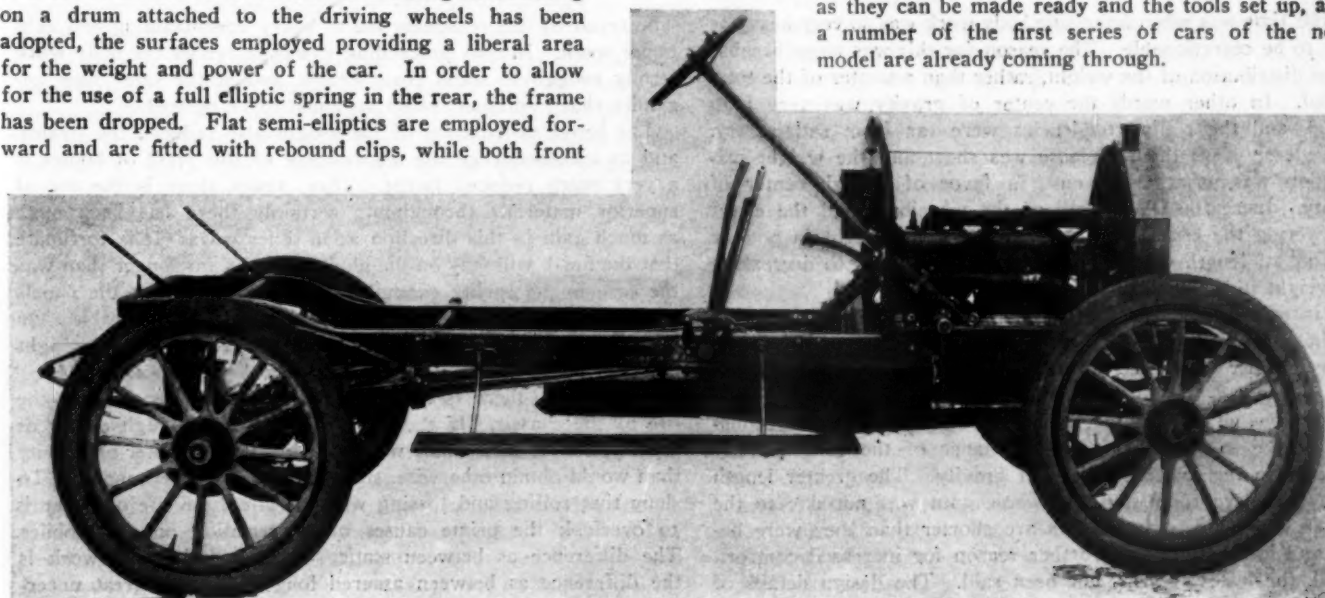
The 1909 Regal When Equipped as a Three-Seater.

driving combines a three-speed selective change-speed gear box, the bevel drive and the differential in a housing of small dimensions and correspondingly light weight for the whole member, thus obtaining the advantages of the unit form of construction in assembly without the disadvantage of a great deal of unsprung weight on the rear tires. The rear axle is of the fixed type, being made fast at the outer ends directly to the wheels, Hyatt roller bearings being interposed between the driving shafts and the supporting tubes, while ball bearings are used in the gear-set. The usual rear wheel braking equipment in the shape of a set of internal and external contracting shoes acting on a drum attached to the driving wheels has been adopted, the surfaces employed providing a liberal area for the weight and power of the car. In order to allow for the use of a full elliptic spring in the rear, the frame has been dropped. Flat semi-elliptics are employed forward and are fitted with rebound clips, while both front

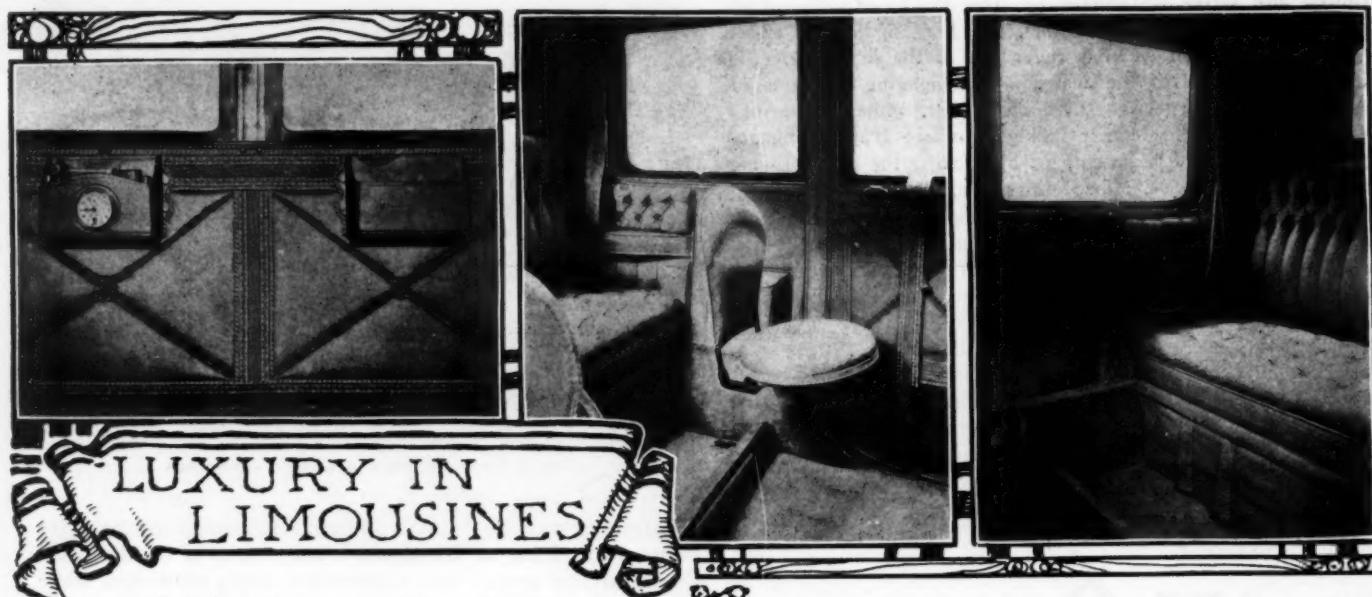
and rear springs are of ample length and number of leaves to insure easy riding at all speeds. The frame is of the usual channel section pressed steel construction, amply reinforced, while the front axle is of the tubular type. The wheelbase is 106 inches.

This chassis will be known as Model A in the regulation touring-car type, and as Model B, as a roadster. Throughout the design every effort has been made to keep the weight down while still providing a liberal factor of safety, with the result that the touring car complete tips the scales at 1,900 pounds, and the runabout is 75 pounds less. In addition to these two there will be the Regal Model C, which will be continued as a taxicab, while Regal Model E will be equipped with a toy tonneau type of body and will be ready for delivery about January 15, so that the Regal line for 1909 will present quite a range of models, although but one type and size of chassis will be made, thus making it possible to center the entire facilities of the plant and working force on the production of series of the same sizes in parts throughout the entire manufacturing season. In this way the number of complete cars that can be turned out in a given time is very largely increased.

The Regal factory has been running night and day for some time past in getting cars, but with the recent addition of fully 50,000 feet of floor space it is anticipated that no difficulty will be encountered in building and delivering the output of 2,000 cars that have been planned for. New machinery is being installed in the additional factory buildings as fast as they can be made ready and the tools set up, and a number of the first series of cars of the new model are already coming through.



Stripped Chassis of the Regal, Showing Simple Lines of Design and Clean Underbody.



## LUXURY IN LIMOUSINES

AS typical of the present day refinements in high-powered limousines is the interior of a special car for Robert L. Fryer, of Buffalo, built by the E. R. Thomas Motor Company. This body has an interior seating capacity for five people, the auxiliary seats being detachable. When not in use these are simply removed from a socket, which is then very inconspicuous. The car is a six-cylinder 70-horsepower Thomas, with a hand-hammered aluminum body made in the new two piece construction. This is the latest type of construction in metal bodies and one that is thought well of by the up-to-date coach builders.

The doors have a full royal turn-under and the low base body does away with the awkward appearance sometimes found in large limousine bodies. A wheel house on the side quarters gives ample clearance to the guard and permits the use of chains without the slightest interference.

The car has an effective color scheme. The body is painted a Napier green with black moulding and black upper quarters, while the hardwood finishings are in walnut. A new type of

drip on the roof prevents the water from dripping over the doors. The material of the interior is a golden drab imported broadcloth and the lace is of a French weave to match. While being a full round cornered body, the trimming is put on in a panel or square corner effect. All the fittings are in brass. The toilet case contains numerous articles, as in the latest cases, and the new style hasty notebook. There is also a gentleman's case, containing ash tray, cigar holder, etc. In keeping with the high-grade completeness, there is also a Chelsea eight-day "Safety" limousine clock, most useful as well as ornamental.

The electric annunciator of the new French type and the electric cigar lighter are both neatly arranged. The electric dome light has a Holophane globe. A ventilator in the front of the body, allowing the circulation of air, adds to the comfort of the occupant and can be regulated according to the weather. Instead of using the clouded horn trimmings, this car is fitted with a new Maltese pearl, which is exceedingly handsome. While the outside of the window frames are finished in ebony, the interior is left in natural walnut, harmonizing with the trimmings.

## THE MODERN TREND IN LIMOUSINE DESIGNING

THE time was when limousine body work was so very heavy as to be objectionable. The reason for this was more because of the distribution of the weight, rather than a matter of the total thereof. In other words the center of gravity was very high indeed, and the rolling tendencies were far from satisfactory. In the early days the wheelbase was short and the weight distribution was, on that account, in favor of a high center of gravity. Increasing the length of the wheelbase had the effect of lowering the center of gravity because the weight in pounds per foot of length was increased, which was equal to decreasing the weight in pounds per unit of elevation.

It is easy enough to see that any plan which increases the weight per unit of length, for a given weight, would decrease the weight per unit of elevation, and lower the center of gravity. That a lower center of gravity will help the performance enormously goes without saying, and much of the modern luxuriousness is due to the superior performance of the cars, directly traceable to the lowered center of gravity. The greater length results in more room, but the whole gain was not due to the greater wheelbase, since motors are shorter than they were before and in this fact is a further reason for increased comfort.

Still, the last word has not been said. The design details of limousines have undergone considerable change within a short period of time. It was recognized that easy riding qualities were in a measure due to weight, putting the same in the right place.

The result of this reasoning led to heavy underframing and light upper work. In thus proceeding it was to render the body work strong enough to stand road strains, and at the same time engender that "Pullman" effect so much to be desired.

The better distribution of the weight also reduced the strains, and as a consequence the depreciation of this class of bodies is a very much reduced factor. Then, again, there is the use of superior materials throughout; certainly there has been quite as much gain in this direction as in other ways. It is fortunate that the finish will stay on the modern bodies far longer than was the case in the earlier examples due to the fact that the panels will not split and the vibrations are not nearly so noticeable. On the whole, then, it is plain that the great improvement wrought in limousine construction is not limited to luxuriousness within.

Then again, there is the influence of the limousine upon the life of the chassis. If the body work is with a high center of gravity, the car as a whole will be with a higher center of gravity than would obtain otherwise, since the body is superimposed. To deny that rolling and tossing will not affect the life of a car is to overlook the prime causes of depreciation on automobiles. The difference as between static strains and dynamic work is the difference as between assured long life and a great uncertainty. A limousine, presupposes a user who can afford a good car, and one who would not want to put up with one that has failed to sustain in nearly perfect order.



# COMPARING LONG AND SHORT-STROKE MOTORS

By E. A. MYERS, DESIGNER OF MODEL AUTOMOBILE COMPANY, PERU, IND.

**W**HILE there is so much discussion as to the relative merits of the long and short-stroke motor it is somewhat interesting to make a comparison of the different articles written on the subject and to note the grounds upon which each bases his claims.

In the beginning I will say that my knowledge of gas engine construction has been practical as well as theoretical. During the fifteen years I have devoted to the study of this subject I have superintended the construction and testing of over five thousand engines of a great variety of sizes and types covering the single-cylinder engines from a 4-inch bore up to a 17-inch bore and 30-inch stroke and the four-cylinder from the very smallest to a 16 1-2-inch bore and a 26-inch stroke. Up to six years ago my work covered what is known as the short-stroke engine, and since that time it has been divided between the short and the long-stroke motor, most of the time having been devoted to the latter.

I do not claim to know it all by any means. Others, perhaps, have found out things in motor construction which I have been unable to learn. On the other hand, I do not believe that I will be charged with egotism when I say that I have at least had an opportunity to find out some things denied to the designer who has had experience with the short-stroke or small motor only. In my experience I have found out things which have been of material advantage to me in the construction of larger engines as a result of my work with the smaller high-speed motors. On the other hand, I have secured much valuable information about small motor construction in my work and experience with large engines which otherwise I might never have been able to detect.

When the A. L. A. M. adopted the plan on which the horsepower rating was based it is quite evident that but little thought was given to the question of accuracy of horsepower. At any rate, just now it is somewhat difficult to get any one to admit that he really believed at any time that the stroke had nothing to do with the horsepower of a motor. On the other hand, it has been but a few years since any attorney involved in the trial of a case wherein the horsepower of an engine was in question had but little difficulty in getting gas engine experts to testify under oath that the stroke had nothing to do with the horsepower of the engine and that a motor with the bore equal to the stroke would produce just as much horsepower as another motor with the same bore and with one, two or more inches longer stroke.

We take it for granted that the recent trend of automobile manufacturers toward longer-stroke motors and the comparative tests of the past year have put to rest for all time the contention that a motor with the stroke equal to the bore would produce as much actual horsepower as one of the same bore with the longer stroke and that we need not spend time on this particular point.

## Some Questions to Be Answered.

With this point settled the remaining questions are: First, to what extent does it increase the horsepower? and, second, is the longer-stroke motor more desirable for motor-car construction and service?

In an article recently written by G. H. Baillie he refers to a formula wherein the claim is made that by increasing the stroke 50 per cent. the horsepower is increased 17 per cent. Nothing could be more misleading than a statement of this kind without a detailed explanation on which the claim is based. It appears that those making this statement have lost sight of the fact that speed must be taken into consideration and that it is utterly impossible to give any formula by which the increased horsepower can be shown by increasing the stroke unless

a given speed is taken on which to base the rating. For illustration: We take a 6x6 four-cylinder motor and make a test of it, as compared with a 6x9. At first thought we would figure that the 6x9 would develop just 50 per cent. more power than the 6x6, whereas at one speed it will develop over 50 per cent. more power than the 6x6, and at another speed it will develop less than 50 per cent. Piston speed must be taken into consideration in figuring the actual horsepower delivered.

Other designers may take issue with us at once when we make a statement that a 6x9 motor will develop over 50 per cent. more power than a 6x6, both running at a speed of 400 r.p.m., but that such is the case can easily be demonstrated. On the other hand, the 6x9 will by no means develop 50 per cent. more power than the 6x6 when running at a speed of 800 r.p.m. The question then comes up: How are we going to rate the motor for automobile construction, and where are we going to draw the line, and what formula can be presented upon which the accurate horsepower rating can be based, covering engines of all classes and of different construction? We are free to confess that we know of none that can be proposed that will cover the situation with absolute accuracy. If we had a fixed speed from which to figure then the matter would be simple. But considering the fact that these motors must be run from a minimum to the maximum speed of which they are capable, it is impossible to increase the stroke to the greatest point of efficiency for one speed and secure the same results at all speeds.

## Desirability of Long Stroke.

I state most emphatically that better results can be secured from a motor with the stroke in excess of the bore for general automobile construction, but I also wish to state just as clearly that it cannot be increased advantageously to the same extent that it can be where the motor is to be used for some other purpose where less flexibility is required and where it is to be operated at something near a given speed. In making this claim I base it on the following facts:

**First:** Where I increase the power of a motor by adding to the stroke the power gained thereby is procured without any approximate increase in the weight of the motor and it will not be denied that every move that can be made to increase the power without increase of weight is a step toward high-grade motor-car construction.

**Second:** In expanding the gases farther the exhaust is discharged under less pressure, lessening the noise of the exhaust and decreasing the amount of heat carried off through the exhaust as well as the liability of back pressure.

**Third:** The greatest efficiency and economy is obtained when piston is running at a reasonably high speed. As most cars are now built the speed limit is from 40 to 60 miles per hour for ordinary use. These same cars probably run 80 per cent. of the time at a speed of 20 to 40 miles per hour. Therefore, it would seem that for general use the car is used at an extremely low piston speed, which, as every engineer knows, means loss of power and efficiency. Hence, by increasing the stroke a higher piston speed will be secured for general use of the car.

**Fourth:** The full power of a motor is most needed for hill climbing when the motor is running at slow speed, and right here is where the long stroke shows its advantages over the short stroke. Let us not forget the fact that an internal combustion engine is a heat engine pure and simple. In fact, all engines are heat engines, differing only in the method and the economy of utilizing the heat. In the case of steam engines the coal is reduced by heat to a gas, burned, and a portion of the heat generated is absorbed by water in a boiler,

converted into steam and expanded in the engine cylinder, giving up a portion of the heat in the form of work or pressure on the piston, producing power. The balance escapes in the exhaust, as is the case with the gasoline engine.

#### In the Case of the Gas Engine.

In the case of a gas engine the gasoline is mixed with a definite quantity of air as it is conveyed to the cylinder; this mixture is then burned in the cylinder, producing heat, consequent expansion, pressure on the piston and power, hence the term internal combustion engine as applied generally to gas engines.

The gases so formed contain a given number of heat units to the cylinder. The greater part of this heat is utilized, converted into energy from which the greatest amount of power can be gotten. There cannot be conversion of energy of any kind without some loss of heat and it is a well-designed motor wherein the total number of heat units lost does not exceed 65 per cent. The greater part of this loss is carried off through the cylinder walls and the balance through the exhaust. Therefore, it must be understood that the good designer must strive to convert as much of this heat into work as possible. It will thus be seen that the slower the movement of the piston the greater the loss of heat through the cylinder walls and the less the power from a given size cylinder and from a given amount of fuel. From this it should be quite clear that all the advantages are with the long-stroke motor, not only from a standpoint of power, but from a standpoint of fuel consumption, and that the slower the motor must run the more pronounced are these advantages.

Fifth: The initial impulse is less in the long-stroke motor than in the short-stroke of the same horsepower because of

the smaller area of the piston. In other words, the initial impulse of a 4x4 is approximately the same as a 4-inch bore and 5-inch stroke, hence if you build a motor of the same horsepower as the 4x5 and make the bore equal to the stroke you must necessarily have a greater pressure on the end of the piston at the time of ignition. This means that for a motor of the same power it is impossible to build one of the short stroke that will operate as smoothly as one of the long stroke.

Some one may say that if it is a good thing to build the motor 4x5 instead of 4x4 why not go still further and make it 4x6 or 4x7. Right here is where the distinction must be made between a motor running at a given speed and one running at all speeds, as is required in motor-car construction. I have heretofore tried to show why it is impossible to carry it out as far as can be done with a motor wherein the question of power and economy alone is to be considered. The great range of speed must be taken into consideration as well as the ratio of gearing and the general construction of the car.

Were I designing a motor for racing only the ratio of the stroke to the bore would not be the same as one I would design for a general use car. Again, if I were designing a motor to be run at a constant speed, the ratio of bore to stroke would conform to neither, but would be designed to secure the best results at that speed. Hence, in increasing the stroke of the motor for general car use I do not contend that it can be carried to the extent that all other points of car construction are of secondary consideration to the question of power and economy, but I do claim that the designer who is unable to retain all the flexibility of the very best cars of the latest development and at the same time use a motor wherein the stroke is one-quarter greater than the bore is not doing justice to at least some parts of the machine.

## SOCIETY OF AUTOMOBILE ENGINEERS' FOURTH ANNUAL

TUESDAY, January 5, has been set as the date of the first session of the fourth annual meeting of the Society of Automobile Engineers, and in accordance with the program outlined by the local committee, the members will assemble at the Automobile Club of America in Fifty-fourth street, near Eighth avenue, at 10 a.m. on that date. The entire forenoon will be devoted to tests of different cars to be selected later by the committee, on the club dynamometer, these tests being carried out under the supervision of Henry Souther, a member of the society and the head of the technical committee of the Automobile Club. Following this there will be the usual business meeting and a technical session during the afternoon, the subjects to be discussed being the "Economics of Weight Reduction," by F. D. Howe; "The Factor of Reliability in Ignition Apparatus," by A. Atwater Kent; "Requirements of Automobile Brake Construction," by Thomas J. Fay and Lawrence Whitcomb. Immediately following the conclusion of the reading and discussion of the papers in question the meeting will adjourn for the annual dinner given by the society. This will be held at the Automobile Club. After the dinner the meeting will adjourn to Tuesday, January 19.

The purpose of this second session is to enable members from distant points who will only be in New York for one or the other of the automobile shows to attend the meeting. The clubhouse of the Automobile Club of America will again be the meeting point and the hour will be the same, 10 a.m. A similar series of tests will be carried out on various cars during the morning, while the subjects on which papers have been prepared for the afternoon session are as follows:

"An Improved Type of Compression Coupling," by W. S. Noyes.

"Standardizing Automobile Motor Bearings," by S. P. Wetherill, Jr.

"Some Practical Considerations in Autogenous Welding," by Henry Cave.

"Continuous Form of Engine Indicator," by S. W. Rushmore and H. L. Towle.

This part of the program is not arbitrary, however, and should it be found more convenient to arrange for the presentation of the papers in a different order this will be done. On the occasion of the second session, Tuesday, January 19, only the forenoon will be spent at the Automobile Club of America, the members adjourning to the Engineering Societies building, 29 West Thirty-ninth street, near Fifth avenue, upon the completion of the tests on the A. C. A. dynamometer. The technical sessions will be held in one of the meeting rooms in the latter building and immediately following their close the members will adjourn to the Engineers' Club, directly back of the Engineering Societies building on Fortieth street, where the annual dinner given by the Society will be held. From present indications it appears certain that the attendance will be the largest that the Society has ever had.

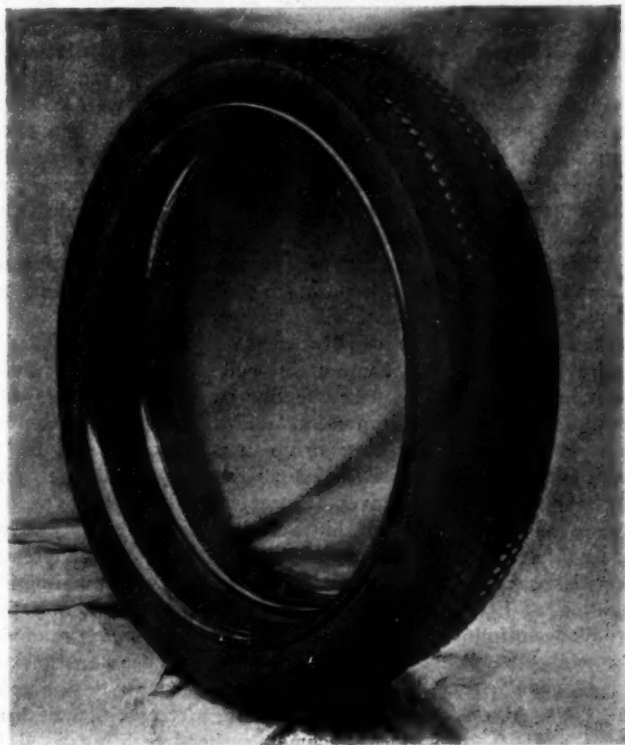
The past year has marked the greatest growth in the membership of the Society since its inception, the number of members having been more than doubled in that time. The plan of holding quarterly meetings in various cities of the country, which was inaugurated last year for the first time, having been found so successful it will be continued, instead of the previous custom of meeting semi-annually. In accordance with this plan, the first quarterly meeting for 1909 will be held in Boston during the course of the show there, while the fourth annual summer meeting will take place in some city of the Middle West. As Detroit and Cleveland were places of meeting during the past year, this will probably be Indianapolis, owing to the importance of the latter city as a center of automobile manufacture, in addition to its vast accessory making interests.



## NOW SEVERAL TIRES ON A SINGLE RIM

By W. F. BRADLEY.

PARIS, Dec. 17.—Automobile touring in comfortable, closed cars, such as are becoming more and more common on European roads, seemed likely to be limited by the inability of tires to carry very heavy loads with any reasonable degree of safety. The largest and strongest tires now on the market, with a section of 135 millimeters, cannot be given a load of more



Showing the Michelin Twin Tires When Dismounted.

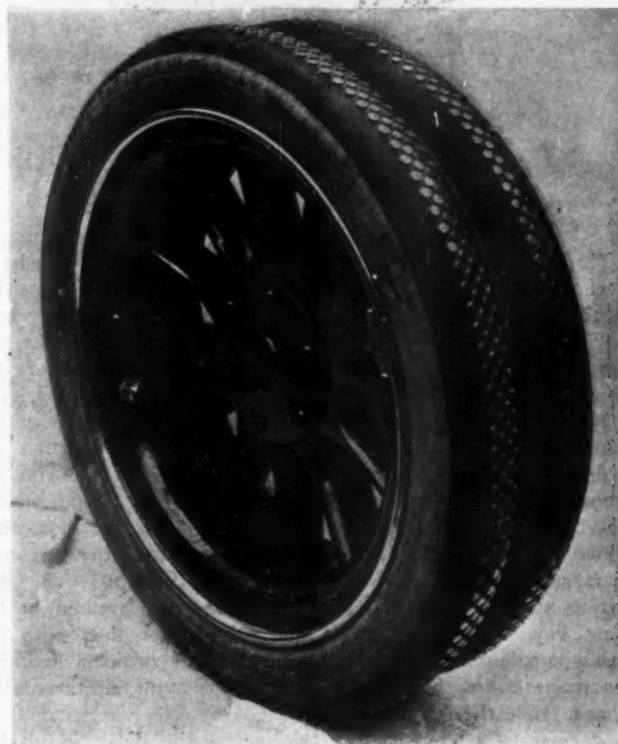
than 1,600 pounds if a reasonable length of service is required. A load of 1,600 pounds per wheel gives about 1 ton 4 hundred weight per axle as the heaviest load which should be carried on pneumatic tires. It is true that many powerful closed touring cars, fitted with all the luxuries that human ingenuity can devise, have a rear axle load of about 4,000 pounds. But such a load is only carried at enormous cost in tire up-keep, for the generally accepted rule is that the life of a tire is in inverse proportion to the cube of the weight which it carries. Thus, if the weight is doubled, the wear will, on an average, be eight times greater. An increase in weight of but 5 per cent. causes an increase in the wear of the tires of about 14 per cent.

The natural conclusion is that weight should be kept as low as possible in the construction or fitting of a car; or if such luxuries as heavy handsomely upholstered closed bodies, electric light, folding tables, self-starters, tire inflators, dismantable rims and the wealth of accessories which have been showered on the automobile, if all these are deemed indispensable, the user of them must be prepared to face a heavy tire bill, for it is weight that kills.

It is with the view of making possible the carrying of heavy loads on pneumatic tires that the plan has been brought forth of mounting two, three or four tires on one rim. Two or three attempts in this direction were shown at the Paris Salon, the most conspicuous being presented by Vinet and Michelin. Even more important than the case of the costly pleasure car is that of the commercial vehicle, for it has been proved that the excessive vibration set up with steel or solid rubber tires, where fast running is necessary, is ruinous to mechanism.

European commercial vehicle competitions have all proved the wheels and suspension to be the weak points of automobiles carrying loads of more than two tons. As long as the speed is kept reasonably low not much harm is done, but too many drivers are not content with a maximum of 15 miles an hour on steel tires, with the result that the car goes to pieces long before it should have done. There is an example in the Paris omnibuses, which are mounted on solid rubber block tires and are run at as high a rate of speed as possible over roughly paved streets, often being made to compete in speed with the subway trains. The result is that out of a fleet of 162 it is never possible to have more than 97 in service, the remaining 65 being in the repair shop and requiring the attendance of about 200 mechanics and fitters. One of the Paris taxicab companies, which in 1902 started out with cabs having steel-shod wheels, had an average of 7 per cent. broken crankshafts a year; the proportion on pneumatic tires was 1-2 per cent.

It is believed, therefore, that if such commercial vehicles as are obliged to maintain a speed of 15 miles an hour or more could be fitted with pneumatic tires in place of solid rubber or steel rims, there would be a considerable lengthening of the life of the vehicles by reason of the lessened vibration. Naturally, in the case of heavy trucks, with loads of six to eight tons, and required to maintain an average speed of six or seven miles an hour, there is nothing to be gained by an attempt to fit pneumatic tires. The advantage, however, is indisputable for passenger buses and delivery vehicles carrying an axle load of from 1,000 to 3,000 pounds.



How the Michelin Twin Tires Look on the One Rim.

The twin and triple tires produced by Michelin, and now being given a public demonstration on a Paris omnibus, were only made possible by the advent of the dismantable rim. If the inside one of a set of three or four tires on one rim required changing on the road, it is easy to see that the old system of wrenching each shoe over the fixed rims would not appeal to the passengers in the bus or to the shareholders of the

company. The dismountable rim was therefore indispensable. Where intended to be used in sets of two or more on a vehicle that does not exceed on an average a speed of 15 or 16 miles an hour, it was possible to strengthen the tire in a way that would not appeal to the fast traveling tourist, but which was excellent for the utilitarian vehicle.

The dismountable rim used on the Michelin consists, like the racing rim, of one fixed rim on the felloe of the wheel, and a split dismountable, the two ends of which are drawn together to bind it on the wheel. On the racing and ordinary touring models this binding is obtained by a turnbuckle—a system that has proved its worth in races on condition that the rim is screwed up as tightly as possible; some French drivers forgot this at Dieppe, and suffered in consequence. On the twin and triple tires there are two flattened portions of the fixed rim, one of these being pierced to receive the valve and bearing also a couple of stops corresponding with similar stops on the dismountable rim, the objects of which are to prevent creeping and facilitate mounting.



Palmer Blowout Preventer Shown at the Paris Salon.

Through the other flattened portion is passed a hardened steel stud, bored to take a bolt, and itself secured in position on the face of the rim in just the same way as a security bolt. A "T" wedge fits on this flattened face, and between the two rims, the stem end of the "T" screwing into the stud just mentioned, and the two arms of the "T" forming wedges, each engaging with a steel stud riveted onto the inner face of the dismountable rim, at each side of the split. The further the wedge is screwed in the closer the two ends of the rim are brought together, and the tighter the whole is bound on the wheel. To dismount the rims the outer wedge is first withdrawn, and a pair of forceps employed to force the two ends apart sufficiently to allow the rim to be lifted off. The projecting stud is taken off and the second tire treated in the same way. The operation is naturally longer than with the racing rim, but it should not occupy, under ordinary working conditions, more than ten minutes to dismount all three rims from a triple tire.

After tests extending over two years—the delay in placing on the market was principally on account of the dismountable rim—it is declared that two or three tires working side by side last from three to seven times longer than a single tire, with an equal load, working alone. The Paris 'bus now in service with these rims has three tires on each of the back rims and two on the front wheels. The weight of the vehicle, with eleven passengers, driver and conductor on board, is about 8,000 pounds. The 'bus is of a special type, with an armchair for each passenger and luxurious fittings.

### SOME BRITISH AUTO DOINGS.

LONDON, Dec. 17.—The membership list of the Royal Automobile Club has just reached the 4,000 mark, a figure not approached by any other automobile club in the world. The number of the official gazette which gives this information also shows that the club's declaration of war against the inconsiderate driver is being acted upon. Legal proceedings have been taken in two cases of dangerous driving.

The differences between the Royal Automobile Club and the more democratic Motor Union are still unsettled and each body is seeking the support of the provincial clubs. A large number of these, however, have decided to associate with the two head organizations conjointly, or else not at all, and this evidence of opinion will probably lead to a peaceful settlement.

Three years ago much stir was caused by the announcement that the manufacturers of the Mercedes cars were about to institute proceedings against all British makers whose cars were fitted with gate change. The general opinion was that the German firm had a strong legal case, and hence it was somewhat surprising to find that the matter was allowed to drop. Now it is stated that immediate action is to be taken, and the probable result will be that, with the exception of the Daimler Company, who hold a separate valid patent for their gate change, all British makers will pay royalty.

Newton, that prince of Brooklands drivers, has decided to retire from the racing game at the end of the year, but before then he is anxious to place the two 90-horsepower records at a figure far above their present level. Several times lately he has got the big Napier *Samson* up to a 120 m.p.h. gait for the half-mile, and it is possible that as much as another 10 miles an hour may be added, given favorable weather conditions.

The unnecessary use of big acetylene lights on city streets has of late become a grave public nuisance. The London authorities have made the first move by entirely prohibiting the lighting of headlights within the city, and other municipalities are likely to follow suit. Many devices have been tried to obviate the excessive upward glare from these lamps, but none have attained popularity. To encourage improvement in this direction the Royal Automobile Club is organizing a competition of headlights and of anti-dazzle attachments, the date being fixed for early in the new year.

### BRITISH MAKERS FAIL TO SEE IT.

LONDON, Dec. 10.—Lending support to the rumor that there will be no Paris show in 1909, the Chambre Syndicale has made a definite proposal to the Society of Motor Manufacturers and Traders that if the latter will agree not to hold the Olympia show next year the French likewise will not have an exhibition. This suggestion is regarded rather with amusement by the leading British traders, who see no possible reason why they should cut off an undoubted source of business merely to oblige their Continental rivals. A second suggestion, that the Paris and British shows should alternate year by year, has met with no better reception, and hence it is definitely fixed that Olympia shall again open its doors next November.

### SALT LAKE TO HAVE A MOTORWAY.

SALT LAKE CITY, UTAH, Dec. 21.—Leases have been signed for the right of way of the new automobile speedway from this city to Saltair, Utah. This will be built by a stock company and backed by the Salt Lake Automobile Club. The boulevard, which will be 25 feet wide and over 12 miles long, will cost, according to the promoters, no less than \$50,000. The sources of revenue will be a small fee charged for the use of the boulevard, but the larger item will be the race meets, at which it is proposed to hold straightaway contests of one, five, and ten miles, all of the famous racing machines being expected. A modern grandstand will be erected just outside of Saltair at the end of the 12-mile straightaway.



## PROPOSED LAW RESULT OF GOVERNORS' CONFERENCE

BOSTON, Dec. 21.—Acting in accordance with the suggestions made at the recent conference in this city of the governors of the New England States, the Massachusetts Highway Commission has drafted and reported to Governor Guild a new automobile law suitable for adoption by all the New England States. One of the things brought most prominently to the front in the conference of governors was the necessity of uniformity in dealing with automobilists, and in making up this bill the commission has studied the existing laws of nearly all the States, taking from each such things as seemed desirable for a uniform law, and also including some new features, which the experience of the commission in dealing with automobilists the past five years has shown to be advantageous. It is probable that the bill as drafted will be offered before the Massachusetts Legislature as a substitute for the present automobile law, and it will also be offered before the legislatures of the other five New England States. Numerous changes are made in the existing law, some of them being intended to increase the rights and privileges of automobilists, while others are restrictive in character.

One of the most notable of the changes proposed is to increase the maximum speed limit from twenty to twenty-five miles an hour in the open country. Twenty miles is the legal limit in Massachusetts, but some of the other States have twenty-five miles as a limit. It was felt by the commission that with proper safeguards as to reckless driving and the proper enforcement of these provisions the limit could safely be raised to twenty-five miles. But whereas under the Massachusetts law speeding in excess of twenty miles is *prima facie* evidence of improper driving, under the new draft speeding in excess of twenty-five miles will be conclusive evidence. The new draft also increases the limit in thickly settled sections, making this fifteen miles an hour instead of twelve as formerly. Speeding in excess of fifteen miles in thickly settled sections is to be *prima facie* evidence of improper driving. The limit at corners, curves and intersecting ways, including entering ways, is kept at eight miles an hour.

The draft provides for the elimination of local speed regulations, including those passed by park boards. Local authorities and park boards may make such local regulations, but they will not be valid unless approved by the Highway Commission, and the automobilists will not be under the necessity of taking the initiative in bringing such local regulations to the attention of the commission by filing a protest. It is provided in the law that, although speed in excess of twenty-five miles an hour is conclusive evidence of improper driving, a court may place cases on file whenever in its opinion the offence was unintentional or it is shown that nobody could be injured.

This change in the speed limit is a great concession to the automobilists, but they are to be made to pay for their privileges

if the proposed law is adopted. Registration fees are to be based on horsepower, and the horsepower is to be determined by the authorities in charge of automobiles in each state. The proposed scale of fees is \$5 for cars under 10 horsepower, \$10 for cars of 10 and under 20 horsepower, \$15 for cars of 20 and under 30 horsepower, \$20 for cars of 30 and under 40 horsepower, \$25 for cars of 40 and under 50 horsepower, and \$30 for cars of 50 horsepower and over. Motorcycles are to pay \$2 and commercial vehicles \$5. How the Massachusetts Highway Commission would determine the horsepower, whether by actual measurements or by catalogue specifications, is not stated.

Another increased charge on the automobilist in the proposed law is an annual renewal of operators' certificates. At present in Massachusetts private operators' certificates are not renewed from year to year, though the annual registration system prevails.

For the second offence of driving while intoxicated the new law proposes a penalty of six months' imprisonment, while minimum fines are established for the ordinary offences, \$10 for the first offence, \$25 for the second and \$50 for the third, within the same period of twelve months. Driving cars for racing or on a bet or wager of any kind is specifically prohibited.

It is proposed to make some important changes in the law as applied to non-residents. In Massachusetts non-resident owners may now drive their cars for seven days without securing a Massachusetts registration certificate. The new law proposes to extend this period to ten days and to allow chauffeurs as well as owners to drive cars during that period. But people whose home is in other States, and who live in Massachusetts or any other New England State for three months or more in a year, must register in Massachusetts and can secure a certificate for half price. This is intended to cover the cases of Summer residents.

Private operators' licenses will not be issued to persons under 16 years of age and chauffeurs' licenses to persons under 18 years of age. Further, nobody can operate who is under 16 years of age, even when accompanied by a chauffeur.

It is provided that all persons receiving compensation in connection with automobiles, such as salesmen, repairmen and the like, shall be considered as chauffeurs. Every car over 10 horsepower must have double sets of brakes, and when the car is standing the motor must be stopped.

The requirement for numbers on the side lamps is dropped, but a new requirement is made that the rear registration number shall be illuminated. Persons who rent cars are considered as dealers, this including presumably taximeter cab companies, and they may have uniform number plates. In every garage it is required that a record be kept of the entrance and exit of every car, and the word garage is defined to include club and private garages where fees are charged, as well as public garages.

## QUAKERS EXPECT TO SEE A CHANGED JERSEY LAW

PHILADELPHIA, Dec. 21.—Quaker City autoists are looking for a revamping of the Frelinghuysen law at the coming session of the New Jersey Legislature. Not only have the long-continued complaints of the seashore bonifaces had their effect on the legislators, who are ready and willing to make the required changes, but even Motor Vehicle Commissioner Smith gives evidence of a change of heart. Of course, that official has had to carry out the law as it is on the books, but to many he has seemed a trifle overzealous at times. Now the Commissioner is out with a suggestion that everybody who desires a bettering of the lot of the automobilist who tours—or would like to tour—in New Jersey should hold a conference and decide on what amendments will be necessary to bring about improvement.

Mr. Smith admits that the Frelinghuysen law isn't the best

ever, but thinks some allowance should be made for the legislators, who have been tinkering with the railroad laws for over half a century and haven't evolved an ideal yet, whereas they have wrestled with the automobile problem but five short years, and they cannot be expected in that short time to have learned it all. At any rate, they have learned something from this year's experience, when tens of thousands of dollars have been lost to the State's hotelkeepers and tradesmen through the practical boycotting of New Jersey by the automobilists, and now there are evidences of a willingness on their part to not only emasculate the Frelinghuysen law of the bulk of its harshnesses, but to make amends for the past derelictions by putting a law on the statute books which will make a veritable autoists' promised land of the erstwhile inhospitable "Garden State."

# THE AUTOMOBILE

Vol. XIX

Thursday, December 24, 1908

No. 26

## THE CLASS JOURNAL COMPANY

Thirty-ninth Street Building, 231-241 West 39th St.  
New York City

H. M. SWETLAND, President

### EDITORIAL DEPARTMENT

A. G. BATCHELDER, Managing Editor  
R. F. KELSEY, Associate Editor C. B. HAYWARD, Engineering Editor  
W. F. BRADLEY, Foreign Representative

### BUSINESS DEPARTMENT

A. B. SWETLAND, Business Manager  
LOUIS R. SMITH FRANK B. BARNETT  
W. I. RALPH, 1035 Old South Building, Boston, Mass.  
C. H. GURNETT, { 1200 Michigan Ave., Chicago, Ill.  
F. W. VAN SICKLEN, {  
H. H. GILL, Detroit, Mich.  
T. B. VAN ALSTYNE, Philadelphia, Pa.

Cable Address - - - - - Autoland, New York  
Long Distance Telephone - - - - - 2046 Bryant, New York

### SUBSCRIPTION RATES:

United States and Mexico - - - - - One Year, \$3.00  
Other Countries in Postal Union, including Canada - - - - - One Year, 5.00  
To Subscribers—Do not send money by ordinary mail. Remit by Draft,  
Post-Office or Express Money Order, or Register your letter.

### FOREIGN SUBSCRIPTION AGENTS:

ENGLAND:—W. H. Smith & Sons, Ltd., 186 Strand, London, W. C., and all their  
railroad bookstalls and agencies throughout Great Britain; also in Paris  
at 248 Rue de Rivoli.  
FRANCE:—L. Baudry de Saunier, offices of "Omnia," 20 Rue Duret, Avenue  
de la Grande Armee, Paris.  
GERMANY:—A. Seydel, Mohrenstrasse 9, Berlin.

Entered at New York, N. Y., as second-class matter.  
The Automobile is a consolidation of The Automobile (monthly) and the Motor  
Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903,  
and the Automobile Magazine (monthly), July, 1907.

Copies printed in 1905	- - - - -	730,000
" " in 1906	- - - - -	791,000
" " in 1907	- - - - -	888,900

## THE STEADY GROWTH OF AN INDUSTRY.

In two recent issues we have published no less than twenty-one notes of commercial cars in nineteen different cities of fifteen State and two foreign countries. These have included the whole range of commercial cars, taxicabs, trucks, tractors, railway motor cars, passenger buses, police, fire, ambulances, school, board of health, board of public safety and public works service.

We mention these figures taken at random for the purpose of emphasizing the fact that this gradual movement or undercurrent is international and universal rather than local or sectional. To recall our statistics given above, we may make the additional statement that no less than eight of these are in the nature of repeat orders after an extended and eminently satisfactory test of a previous utility car, and in every other case but one it is a case of one installation being modeled after a successful one in another city, which when analyzed also assumes the aspect of a repeat order.

From the foregoing we are perfectly safe in the statement that the commercial car is gaining ground all over the world and for every purpose. The rapid advance in motor propelled fire apparatus may be mentioned as

particularly worthy of notice. This particular branch has made most unusual progress, partly on its merits and in a small part from the scarcity and consequently high price of suitable fire horses. And horses are subject to ailments that are many and varied.

And yet this branch of the industry, and the commercial vehicle industry as a whole, is only in its infancy. Manufacturers of pleasure cars in this country the coming year will reach the 65,000 mark, but we doubt if the whole commercial car output for the coming year will be 5 per cent. of this figure, and if we except cabs, the figures will probably not run as high as 3 per cent. Whereas in the future there is no reason why the figure may not go up to 70 per cent. of the number of pleasure cars, while the latter then will have increased say to 125,000. This means for the commercial industry an increase of no less than 3,100 per cent., which spread over a period of five years would be an increase of 100 per cent. each year. How many of our commercial manufacturers are prepared to double their facilities and consequently their output each of the next five years? Similarly how many of our pleasure car manufacturers are prepared to get their share of this great wonderful increase, as compared with the pleasure car increase of about 92 per cent. total or a little over 13 per cent each year?



## NOW A BASIC PATENT IN DUAL IGNITION.

Basic patents so broad as to be the basis of a monopoly are, fortunately, very scarce, the statement of which fact does not mean to infer that the inventor of a device should not be protected and afforded the just reward that merit indicates. A basic patent affords the means honestly to demand merit; in other words, dollars. There is a difference between a basic patent and a belated "broad" patent. The "Selden" patent to many has had the air of a belated patent, and the courts are still trying to decide its scope in the light of basic principles.

The "Apperson" dual ignition patent, in conjunction with the "Canda" patent of earlier vintage, may, in some measure at any rate, create something of a furor. If it can be shown that the inventor did invent, rather than to take advantage of the absence of earlier applications for "letters patent" current with advances in the state of art, then it is plain to be seen that the inventor should be allowed to spend the product of his brilliancy and what of energy the situation demanded.

On the other hand, there is something abhorrent in the plan that allows a broad patent to go to issue years after the device has become a common expedient, through its common use on dozens of different designs of automobiles or what not. True, the inventor should not be allowed to suffer if the delay is due to inactivity in the patent office, and at the same time the cause of the delay should be ascertained, if possible.

The extent to which the ignition patents under discussion will prove akin to basic principles, is a matter that can not well be foreshadowed in view of the uncertainty of the rulings of courts, as the records bearing upon the subject will adequately prove. In general, it is the case that the inventor is entitled to his claims and the good that may come of them, if they are not contested; the cost of contesting can be more than the royalty that fairness might reasonably demand.



## ONLY ONE AMERICAN CONCERN SEEKS TARIFF REDUCTION

WASHINGTON, D. C., Dec. 21.—In the concluding minutes of his appearance before the Ways and Means committee, which at present is occupied with the subject of the tariff, John J. Carton, attorney for the Buick Automobile Company, last week unwittingly explained the attitude of the company, for which he made a plea for the reduction of the duty on automobiles. Representative Boutelle, by reference to former testimony, asked if the Buick company did not intend to start a factory abroad. The question failed to elicit a direct response, though it is a well-known fact in the automobile industry that Buick cars are being manufactured at Oshawa, Ontario, by the McLaughlin Motor Car Company, Ltd., which is understood to have a direct connection with the Buick company at Flint, Mich.

Commenting upon Mr. Carton's unsatisfactory answer, Mr. Boutelle remarked: "If this is a fact, it will explain much that is now a mystery. It will explain why you wish a lower protection on an American product, as you are going to become a foreign manufacturer."

"It is unlikely," replied Mr. Carton, "that we are arguing against our own business. We have a factory in Michigan, and it doesn't seem probable that we would try to hurt its business in order to help our possible activities abroad in the future. Besides, I don't know about that foreign factory with certainty."

Previously Mr. Carton had said: "From my talks with the general manager of our company, W. C. Durant, I desire to state to the committee that we are occupying somewhat of a middle ground. We differ from those who want a 45 or 60 per cent. tariff, and we also differ from those who do not want any tariff. The company which I represent, and for whom I speak, is of the opinion that there should be a moderate tariff placed upon the importation of automobiles, somewhat from 20 to 25 per cent. The general manager of our company is of the opinion that a 25 per cent. ad valorem tariff would be a sufficient tariff to take care of the automobile industry and to give it proper protection in this country."

"Now, it is a fact that the Buick Automobile Company is to-day selling automobiles in Europe and selling them there in competition with the automobiles manufactured there, and selling them successfully. Of course, at the present time they are not manufacturing an automobile which, in the common acceptance of the term, is as high grade as some of the other factories, but Mr. Durant said to me in a conversation the other day, and authorized me to say it here, that next year they will turn out as high-grade automobiles as any factory in the country—as good an automobile as can be made—and that they will sell it at 70 per cent. of the price which is now being charged for the same grade of automobiles by the so-called high-grade factories."

"Now, improvements are constantly being made, and the business of the manufacture of automobiles is being reduced more and more to a science every day, and there is, in the opinion of the gentlemen I represent, very little to fear from foreign importations. Of course, there should be something on it to make the difference—to take care of the difference—in labor."

Chairman Payne asked Mr. Carton if he thought 20 or 25 per cent. would make up the difference between the cost of labor here and abroad, to which the latter replied: "Yes, taking everything into consideration. That is what I am advised." Chairman Payne then wanted to know why the motor car was not a pretty good thing to produce revenue upon. Mr. Carton replied: "Well, yes; the question is whether you will produce more revenue with a 45 or 60 per cent. duty than you will with a 20 or 25 per cent. duty." Mr. Payne said it would seem at first sight that the automobile was a sort of luxury that could well afford to contribute to the revenues of the government, to which Mr. Carton replied that the automobile as a luxury was fast passing out of that stage.

Representative Crumpacker wanted to know how Mr. Carton, as a manufacturer, would be interested in having the tariff re-

duced on automobiles; in a word, what effect it would have. Mr. Carton thought it would be better for the trade generally by and by. Judge Crumpacker then wanted to know how, in the future, a reduction of tariff would improve business in this country. Mr. Carton replied that he did not know that it would improve the business, but he and his associates did not think it was necessary to have a high tariff on automobiles. "If the tariff were reduced from 45 per cent. to 25 per cent., in order to obtain the same revenue, we would have to import about twice as many automobiles as we have before, and that would displace an equal number of the American make?" asked Representative Crumpacker. Mr. Carton replied it might be so considered. Judge Crumpacker said he asked the questions because he had not been able to understand the interest the Buick people had in the manufacture of automobiles in the reduction of the duty from 45 per cent. to 20 or 25 per cent. To this Mr. Carton said: "Well, I am presenting the views of the managers of the company. They are of that opinion. We are protectionists, so far as that is concerned, and we think that there should be sufficient to compensate for the difference in the wage scale. But outside of that there isn't any reason why an automobile could not be made here, considering the skill and workmanship of the American manufacturers and the American workmen, cheaper than they are made in Europe."

Representative Dalzell asked about the Selden patent. Mr. Carton replied: "We are not paying any license fee. We have concluded that the Selden patent does not mean anything."

"That is all right," said Representative Dalzell, "but you have been paying?"

"Yes," replied Mr. Carton, "but we have declined for a year or more now to recognize it."

It was then that Representative Boutelle said he could not understand why the Buick concern went to the expense of sending somebody down to Washington to make an argument for the lessening of the duties. It seemed, he said, more or less of a mystery to him.

### Mr. Durant Evaded the Question.

WASHINGTON, D. C., Dec. 21.—The Ways and Means Committee gave a hearing Saturday to W. C. Durant, of the Buick Motor Company, and the following excerpts from his testimony are of interest:

"Mr. Carton, our attorney, appeared before the committee some days ago at my request, because it was impossible for me to present the case. He stated the case as best he could with the limited knowledge possessed by him, having been called upon to help me out of a difficulty, and I had a conversation of about two hours with him, attempting to express my views. I wish to correct some of the statements made by Mr. Carton, fearing that the committee may be laboring under a misapprehension."

"The Buick Motor Company has been accused of being interested in the reduction of the tariff by reason of owning a factory in Canada. I wish to say that the Buick Motor Company does not own or control a factory in Canada, but has a very slight interest in an institution in Canada. That concern last year, as I understood, employed a capital of \$65,000. They produced 197 automobiles. It has been represented that the fact that we are interested in a small way in that Canadian plant is operating against the statements which we are now making, and which we hope might enable the committee to give us a reasonably fair tariff bill."

Mr. Durant submitted certain figures bearing on the direct cost of labor in the manufacture of an automobile, and got into a wrangle with the committee over the figures.

He was asked the direct question if his company contemplated erecting a factory abroad, but evaded the question by saying that his company was after foreign trade.

## A BUDGET OF LATE NEWS FROM TIRETOWN

**A**KRON, O., Dec. 21.—The Mansfield Rubber Company, of Mansfield, 65 miles west of Akron, has been organized by F. A. Wilcox, of this city, with \$250,000 capital stock. Mr. Wilcox has been elected president, and the other officers are the following: Vice-president, C. H. Walters, Buffalo; secretary, F. W. Walters, Buffalo; treasurer, F. M. Bushnell, Mansfield; directors, F. A. Wilcox, C. H. Walters, F. W. Walters, L. Hautzenroeder, F. M. Bushnell, H. Homberger, W. H. Bissman. The company will manufacture especially the National tire tube, but will be devoted entire to turning out high-grade pneumatic tires and casings and a full line of molded and mechanical rubber goods. The plant is to be installed by January 10 with a complete equipment, which is to include a Harris-Corliss engine of 550 horsepower, with four boilers of 200 horsepower. By March 1 the plant is to be in operation, and forty experienced rubber men, some from here, will go to Mansfield. By next Fall it is expected 250 persons will be employed.

Mr. Wilcox is a director of the Pennsylvania Rubber Company at Jeannette, Pa., and he and C. H. Walters were the early managers of this same company when located at Erie. Messrs. Walters were connected with the Victor Rubber Company for years, and Mr. Wilcox organized the India Rubber Company, of this city, which he managed until it sold out to the trust.

### Tire Town Has a Little Auto Show.

The Akron Auto Garage Company, A. Auble, Jr., and F. C. Wood, managers, gave a very successful automobile show this week, representatives of five auto manufacturers and of numerous accessory concerns being present. This is the second show of the kind given here, and interests the entire trade of the city. One of the most interesting features was an aeroplane model exhibited by Fred T. Childs, a local machinist, whose flying machine moved about at the will of the operator easily. Childs expects to construct a full-sized aeroplane next Spring. It will weigh about 600 pounds and will be equipped with a 25-horsepower engine weighing only 110 pounds. It will carry its wings in such way that the inventor claims such an accident as occurred to the Wright machine will be avoided.

At this show Winton, Oldsmobile, Franklin, Baker Electric, Peerless and Buick cars were shown in 1909 types, and two

of the Webb auto fire trucks were also shown. All of the Akron manufacturers of accessories were well represented with exhibits. Several Eastern companies had representatives present.

### International Harvester Has New Air Cooler.

The International Harvester Company has completed a test car and is now ready to turn out a new style of air-cooled automobile with four-cylinder engine and tourabout body, which will constitute a roadster much larger and more imposing than the ones now manufactured at the rate of ten a day here. The test car has already been put through hard work, one continuous run of 35 miles bringing the engine through in the best of shape, with the air-cooling apparatus working perfectly, there being no sign of heated parts. The engine will have a heavy horsepower. While it is to be something on the order of the famous Franklin engine, the designer expects it to be more powerful. In connection with it Mr. Johnston, the designer, has invented a starting mechanism for explosive engines also.

### Motz to Extend Its Operations.

The Motz Clincher Tire & Rubber Company, of this city, is preparing to extend its business very materially. Recently the company sold \$15,000 worth of treasury stock, bought principally by the stockholders, and the money will be used to extend the company's operations. Branches are to be established in Chicago and New York after the February shows. P. E. Bertsch will have charge of the New York branch. The company is also talking of establishing a plant, the Buckeye Rubber Company now producing its tires. The lines to be extended especially are motor buggy and other vehicle tires, as well as solid truck, cushion, and special electric tires.

### Firestone Employees Organize Benefit Body.

The Firestone Tire & Rubber Company employees in the factory and office have organized a society known as the Firestone Mutual Benefit Association, for which a charter will be asked soon. It will have several hundred members to start off with, and the purpose is to provide sick and death benefits for the members and to cultivate social ties. The opening function is to be a large dance in the top floor of the new addition to the south wing of the factory.

### OLDS WORKS BECOME JERSEY CORPORATION.

LANSING, Mich., Dec. 21.—Notice to local stockholders in the Olds Motor Works to the effect that they may exchange their holdings in the latter company for shares of the General Motors Company, on the basis of \$4 in preferred and \$1 in common of the new company, for each share of the Olds stock, is the first intimation received here that the Olds Company has been transformed into a New Jersey corporation with a capital of \$12,500,000, of which \$7,000,000 is in the shape of 7 per cent. cumulative preferred shares, while the remainder is common. It is said that an offer was made for 75 per cent. of the Olds Motor Works stock, but was not considered by a majority of the holders, unless the proposal were made to include the entire issue so that all stockholders would have an equal opportunity to exchange on the same basis.

The interests back of the new corporation have acquired control of 75 per cent. of the outstanding stock of the company and will accordingly be in a position to elect new officers and directors, but otherwise there will be no change. No formal transfer of the property will be made, and the corporation will continue the business as heretofore, except that it is said to be the intention of the new interests to greatly enlarge the business. It could not be learned whether there are any other Michigan automobile interests involved or not.

### NEW OFFICERS FOR POPE COMPANY.

HARTFORD, Conn., Dec. 21.—A meeting of the directors of the reorganized Pope Manufacturing Company was held in New York City Friday, and the following officers were elected: Chairman of the board of directors, Harry Bronner; president, A. L. Pope; vice-president, Charles E. Walker; treasurer, Colonel George Pope; secretary, Wilbur C. Walker; assistant treasurer, Ezra M. Cutting; counsel, Joline, Larkin, and Rathbone.

The new company has authority to take over the properties of the company on the payment of the debts of the old concern and the transaction of this is being accomplished with all possible dispatch; the new concern is practically running under its old officers. A petition of the receivers of the old company will be filed in the court of chancery at Newark for permission to make the final payment of the fourth dividend.

### C. O. SACKS NOW PRESIDENT ROWLAND AGENCY.

Clarence O. Sacks, for a number of years associated with the late John B. Rowland, in the Rowland Advertising Agency, has become president and treasurer of that concern. Eugene F. Kinkade, who represents a New Jersey district in Congress and is president of the New Jersey Street Car Advertising Company, of Newark, is secretary and a director of the Rowland Agency.



## OUTLOOK FOR LARGE CAR VIEWED IN CLEVELAND

CLEVELAND, Dec. 21.—Developments in the automobile field during the past half year have not only followed one another rapidly, but have been of such a nature as to give rise to numerous questions of interest concerning what the future may hold in the way of bringing forth new types, or rather of definitely setting the seal of approval on certain types and sizes of cars. Not the least interesting of these has to do with the size of the car; in other words, what is to be the outcome of the "Large Car vs. the Small," and what influence will the trend of the demand during what is now generally conceded to hold forth promise of being far and away the best year the industry has ever experienced, have upon the settlement of this question? With a view to obtaining the opinions of some of those directly concerned, the representative of THE AUTOMOBILE called upon some of Cleveland's leading manufacturers. It will be evident upon reviewing the manner in which they have placed themselves upon record, particularly when taken in connection with the unprecedented amount of business they now have on hand, that the call for high-priced and high-powered machines has never been greater and that there is little likelihood of this phase of the demand for automobiles undergoing any decided change for some time to come. The discussion of this question by Cleveland manufacturers is particularly apropos, as Cleveland has always been a center devoted almost exclusively to the production of machines of the better class.

Alexander Winton, of the Winton Motor Carriage Company, thought there would always be sufficient demand for cars of large power and seating capacity to make it worth while for leading manufacturers to list such a type. "Not that I think there will always be a call for large machines simply on account of their size, as I feel convinced that the day when people were fond of running around with a big seven-passenger touring car, regardless of the requirements of their families, is gone by. Vacant seats in a car have too long been regarded as a standing invitation to one's friends, who would otherwise not be included in a party, and the average owner of a car has long since realized that carrying extra weight around means increased fuel and tire bills. Of course there is a certain legitimate demand for large cars with big bodies, but for every man who has to invest in a seven-passenger car to accommodate the seating requirements of his family, there are ten or twenty whose limit is three or four, so that not a few of our 60-horsepower six-cylinder machines will be fitted as roadsters or with a small tonneau.

"Probably we are not in as good a position to discuss the relative demand for cars of the two sizes as some other makers, as the 48-horsepower six-cylinder Winton was on the market for a whole season before we listed the 60-horsepower size, and naturally our orders for the former are very largely in excess of the calls for the higher-powered car, but even at this early day we have had a very gratifying demand for the big car, and the number of inquiries received by our agencies in different parts of the country goes to show that a very fair percentage of our season's output will be 60-horsepower cars. Many of these will naturally be closed types, such as the limousine and landaulet, and where it is necessary to carry a number of people such as only one of these machines will accommodate comfortably, there is nothing else that solves the problem quite so well. Just what percentage of our total output will consist of the 60-horsepower type it is difficult to predict now."

Walter White, of the White Company, thought it a hard matter to say at the present moment just how the demand would shape itself in the next few months where the two sizes of White steamers that are now being turned out are concerned. "Having come out with the announcement of the 20-horsepower White early in the season, we have naturally had to devote considerable attention to its manufacture," said Mr. White when seen at his office, "and have already produced a series of these

cars, which are now being delivered as rapidly as is possible.

"It strikes me that the real question, at least so far as we are concerned, is not so much what sizes of cars to turn out as how to be able to turn out more of them. That is the situation that now confronts us, and it applies more particularly to the large car than to the new White of less power. When it comes to a shifting of the demand in either direction, our facilities are such that we will be in a position to take care of our orders one way or the other, and the same thing applies to the total number of cars that we will build during the season, as we have always found that no matter what our plans made at the beginning of the season happened to call for, we were compelled to exceed the original number to a greater or less extent. Judging from the present outlook, the prospects are that this will be the case next Spring."

George J. Dunham, president of the newly reorganized Royal Company, now known as the Royal Tourist Car Company, was enthusiastic over the outlook for a high-grade car along similar lines to those of present standard models, but of smaller dimensions, and doubtless Mr. Dunham's long agency experience in Boston makes him better qualified to speak on the subject than the average manufacturer, as he has been in direct touch with the purchaser for several years.

"That is my opinion on the subject," said Mr. Dunham, "but so far as we are concerned here at the factory, it will probably be a long time before we are in a position to devote any attention to a new model, other than the one which Mr. Jardine has been perfecting during the last year or two and which we will now begin to turn out in quantities. There couldn't have been a better time to perfect the reorganization of the company, though we would naturally have been in a better position to make deliveries had it come about earlier."

F. B. Stearns, of F. B. Stearns & Company, was confident that there would never come a time when those American makers who had achieved a reputation for their product in the past several years, would find it difficult to sell all the large cars they could make. "Regarding the small car question," said Mr. Stearns, "that depends entirely upon what you mean by a 'small car.' We have added what we call a small shaft-driven car to the Stearns line, but compared with what is usually regarded as coming within this category, it is really a large car, but not as powerful a machine as the regular Stearns, on which we are giving an option of chain or shaft drive, though we prefer the former for a big car designed to run at high speeds over all kinds of roads. But the motor of Stearns small car shows 40 horsepower on the test block, and, when equipped with a baby tonneau, of which we are turning out a number, it will also be capable of traveling at high speed, at the same time having all the enduring qualities of the bigger machine. It is practically a smaller edition of the big Stearns with a shaft drive and naturally handles easier in congested traffic, thus making it particularly suited for town work when used with a closed body.

"Things could scarcely be better," continued Mr. Stearns, speaking of the outlook. "By October 1 we surpassed our entire 1908, production, and that month of this year ran several times ahead of the same month a year ago. We planned to build 250 cars last year, and, when the slump came, cut that figure to 200, but there was so little actual falling off in the demand that we built and delivered 243 of the 30-60 Stearns before the end of the season. This year we have made preparations to double that figure by planning to turn out 500 cars, but at the present rate there is every prospect of our running considerably over that."



George J. Dunham.

### DETROIT ENTHUSIASTIC ABOUT SHOW.

DETROIT, Dec. 21.—Allotment of space for the forthcoming show under the auspices of Detroit Auto Dealers' Association, proves conclusively the accuracy of the statement made earlier in the season that it would be the best ever. Every bit of available space on both floors of the huge Wayne Pavilion, where the show will open February 15, lasting one week, was snapped up by those anxious to participate in the exhibition. Sixteen of those who drew were members of the Detroit Auto Dealers' Association, all large auto concerns. Of the twenty-one non-members some were automobile companies, some motorcycle agents, and some accessory manufacturers and agents.

The latter were the innocent cause of some caustic interchanges of correspondence between "Dada" officials and officers of the Motor and Accessory Manufacturers. At the annual meeting last summer the latter body voted not to take any part hereafter in local automobile shows because of the heavy traveling expenses. Local shows in this resolution were defined as all those save New York, Chicago, and Boston. Failure to sanction the local show was taken by "Dada" officials as an attempt to hamper them, which they promptly resented. Now that the true situation has been made known, peace once more reigns.

### FIRST CHAUFFEUR CONVICTED IN MARYLAND.

BALTIMORE, Dec. 21.—The first arrest to come under the law making it a misdemeanor for chauffeurs to take out the cars of owners without their consent, was that of James L. Hild, employed by President Oscar G. Murray, of the Baltimore & Ohio Railroad Company. Hild was fined \$100 and costs, making a total of \$101.45, while his chauffeur license within this State was suspended for three months. Hild had previously been fined \$25 and costs on a charge of exceeding the speed limit of 12 miles an hour. Hild took the machine, a Packard car, and a party of friends for a "joy ride," early on Sunday morning, December 13. While speeding out Charles street avenue boulevard the car was dashed into a telegraph pole and one of the occupants, Harry Kessler, was killed and the machine wrecked. The coroner's jury decided that Kessler's death was accidental, and exonerated Hild of any criminal charge, but he was compelled to pay the fines on the other two charges. The Automobile Club of Maryland, at a specially called meeting, condemned Hild's conduct, while the State Automobile Commission has determined to embody a severe penalty for reckless driving in the proposed bill to be presented to the next State Legislature.

### BUFFALO TRADESMEN ELECT JAYNES.

BUFFALO, Dec. 21.—W. C. Jaynes, of the Automobile Supply Company, has been elected president of the Buffalo Automobile Trade Association. This step is said by insiders to have averted an open rupture with the Automobile Club of Buffalo. It was recently announced that a faction of the trade association, if elected, would promote a show in opposition to the automobile club show. The defeat of this faction at the polls by Jaynes, known as the "peacemaker," puts an end to the talk. The other officers elected were: Vice-president, Maxwell-Briscoe-Buffalo Company; treasurer, Brunn Carriage Mfg. Co.; secretary, Dai H. Lewis; executive committee, George N. Pierce Company, E. R. Thomas Motor Company and G. H. Poppenberg.

### LUXURIOUS STAGE FOR SOCIETY FOLKS.

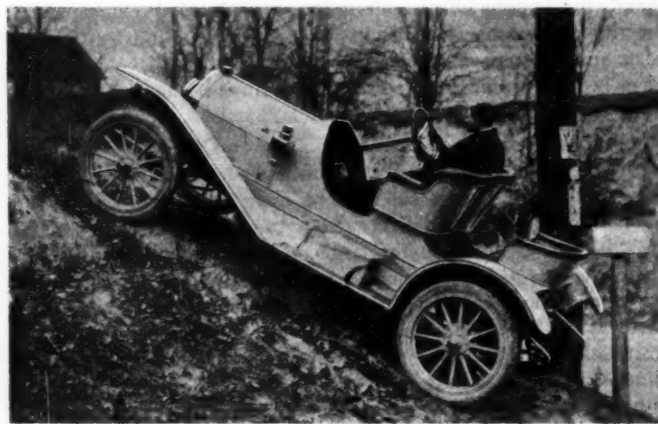
LAKEWOOD, N. J., Dec. 21.—The latest innovation is one intended for the society people who visit this resort. This is the installation of a luxuriously appointed automobile stage or motor 'bus to run from the Hotel Knickerbocker, in New York City, to this resort. The roads are among the best and the scenery en route is very beautiful and picturesque, so that the elegantly appointed vehicle will doubtless be well filled each day. This mode of travel is increasing in popularity daily.

### DETROIT'S TAXICAB INTRODUCTORY.

DETROIT, Dec. 21.—Now it is the taxicab that has fallen under the ban. When the first of these buzzabouts appeared on Detroit's streets they were regarded with curiosity by the old-time cabbies, who for so long had a monopoly of the passenger business. In quick succession came distrust, apprehension, alarm. Now the cabbies are panic-stricken. You can't get one of them to admit this. The fact remains, however, that they have united to compel the taxicabs to operate under the ordinance governing the rates of fare to be charged, and in this manner hope to check the rapid inroads made on their business.

The cabbies have long enjoyed the privilege of having their conveyances stand about the city hall waiting for passengers. The taxicabs have the consent of hotel and café proprietors to stand outside their establishments and skim off the cream of the business, hence the trouble. As a matter of fact, the taxicab fare by the hour is cheaper than that charged by the cabbies. It is only on the short haul that the latter's rates are more reasonable.

A suit to determine the status of the taxicab and discover whether it is amenable to the existing ordinance has been instituted by Police Commissioner Smith, and the outcome is breathlessly awaited by local Jehus.



Literally Overland in an Overland Car.

Frank Moore, manager of the Fisher Automobile Company, Indianapolis, driving his Overland roadster up one of the steepest bluffs in the neighborhood of that city.

### AUTO MAIL COLLECTING IN INDIANAPOLIS.

INDIANAPOLIS, IND., Dec. 21.—The local post office last week placed in service two gasoline cars for the collection of mail and the cars are to be run to all parts of the city.

The cars in use were built by the Overland Automobile Company and will be leased by the post office for one year as an experiment. After that time if the test is successful all of the mail collection work in the city will be done with automobiles.

Bodies enclosed with heavy screen wire and canvas as a protection from the cold are mounted on the regular chassis of Model No. 32 Overland. The cars are painted red, white and blue, after the style of the horse-drawn mail wagons. There are two of the automobiles and so far have given excellent service. Drivers are supplied by the Overland Automobile Company, a carrier accompanying each car.

### PROVED ECONOMY OF AUTO OVER HORSE.

PHILADELPHIA, Dec. 21.—The Oxford Automobile Company, local agent for the Brush car, gave a very convincing demonstration of the workings of the Brush package-delivery wagon last Saturday, when a route of 101 stops was covered in 2 hours 39 minutes, as against the best previous 5 hours 14 minutes with a horse-drawn team. At \$600 this little wonder figures out as a sure economical proposition, especially in rush times like the Christmas holidays.





Speedwell Rapid Delivery Truck—a Successful Commercial Car.

This car is designed to carry a load of 3,500 pounds, although some of them have successfully carried as high as 5,000 pounds in an emergency. The chassis, including the driver's seat, is so built that any type of body can be mounted thereon. The makers, the Speedwell Motor Car Company, Dayton, O., report a heavy demand.

#### Weights of Accessories, Tools, Etc.—

The subject of weights and weight distribution has of late come to be a very interesting one. Beginning with the practice of some makers of suspending the body between the axles to get the proper distribution of weights, we may look into the matter of accessory weights. It is a fact that the average automobile owner cannot tell how the weight of his car is distributed. A table prepared by the George N. Pierce Company, of Buffalo, gives a close insight into this matter, so far as Pierce-Arrow cars are concerned. The Pierce-Arrows are equipped very completely, and what is known as the "stock car" has with its equipment, not generally included, these articles: Shock absorbers, 28 pounds; odometer and fittings, 2 pounds; foot rest, 7 pounds; robe rail and brackets, 5 pounds; dash cabinets, 3 pounds; luggage carrier, 17 pounds; tool box, 26 pounds; sprag, 12 pounds; rubber bumpers, 5 pounds; rear axle straps, 2 pounds; gasoline gauge, 1 pound; tools and spare parts, 55 pounds. Aside from the actual mechanism and body of the car there are extras, such as cape top, 138 pounds, and the glass front, 44 pounds, that count in the weight of the car. Water, oil, gasoline and grease add another 220 pounds. The ignition outfit of a Pierce-Arrow adds more weight. Two separate systems are used, a high-tension magneto and storage batteries. The magneto system weighs 32 pounds, and the battery system 70 pounds. Then the lamps, lamp brackets and horn weigh 87 pounds. This added gives a total of 738 pounds over and above the mechanism and body of the car.

#### Does Reo Get the Record or Not?—

An interesting discussion has sprung up between an Eastern and a far Western crowd of automobile enthusiasts relative to a certain record. The question under discussion is: Did Leon T. Shettler win the world's non-stop record run in Los Angeles last March? Shettler's rivals concede that the 4,992 miles which his Reo covered in the sleet and slush around Los Angeles lowered the previous non-stop record by 86 miles. It is alleged that he confined his run principally to the city streets, whereas his rivals covered the roads around Bridgeport, Conn. Thus, it

is alleged to be a non-stop world's record, while the other is a non-stop world's record road run, which is splitting it very fine. Shettler says: "As far as running the Reo over the streets is concerned, fully half the distance was on country roads. We started out to run over the streets of Los Angeles, but they were in such bad condition that we took to the roads. If we had done so in the first place, we would have added about 50 miles a day to the record." There is enough merit in either stunt to justify a medal being awarded to both cars.

**Oil Your Bearings.**—Autoists who have all ball-bearing cars, or cars well equipped with ball or roller bearings, should use oil freely, according to one well-known maker of both. "There is a false impression prevalent that ball and roller bearings do not require oil, but this is incorrect, as they need it not only to prevent rust, due to moisture from condensation or other causes, but they also require it as a lubricant, although a comparatively small amount is consumed," says S. S. Eveland, president of the Standard Roller Bearing Company. "It has been found desirable to use a heavy non-fluid oil or grease, free from animal fat or foreign substance, or a good machine oil fed under pressure, or have the bearings mounted in an oil bath."

#### Demand for an All-Around Car.—

There still exists a big demand for an all-around-the-year car, one that will have lots of power with the touring body on, and yet drive slowly and easily when the summer body has been replaced by the limousine. Commenting on this, James Joyce, president of the American Locomotive Company, says: "We have something out of the ordinary to meet this demand for the all-around machine. This is our 40-horsepower car, which is made with direct drive on the third, as well as the fourth, speed. With this car a man can get about the city on third speed, driving direct and throttle down to the necessary pace, and yet run silently and with no straining of the gears, much the same as with a car of lower horsepower."

**Maxwell Agent Challenges.**—The Maxwell agent at Hartford, Conn., R. D. Britton, has issued a challenge to any car

costing less than \$1,000 for a race in mid-winter from Hartford to Pittsfield, Mass., and return. The distance is 154 miles, and includes some of the worst roads in New England, with many hill climbs, one of which reaches an elevation of 1,500 feet. Mr. Britton has entered two Maxwells, the only conditions being that the race be held within a few weeks; cars must be owned and driven by Hartford residents, and must go the distance under their own power. The Hartford Times will offer a cup if any one accepts Britton's sporty proposition.

**Self-Starting Devices.**—Although few new self-starting devices have been brought out lately, considerable interest is being manifested all over the world. One of the simpler American arrangements consists simply of a clutch and spring attached to the magneto armature, allowing the latter to be spun around. A famous French manufacturer has paid Alexander Winton the high compliment of imitating the Winton device. However, in order to avoid infringement, the French device accomplishes its purpose by a roundabout rather than a direct method, hence the foreign self-starter lacks the Winton's simplicity.

**Lists a 90-Horsepower Racer.**—That speed races help the companies building high-powered cars is shown by the fact that immediately after the recent Savannah races no less than five prominent autoists tried to buy the 90-horsepower Simplex car that made such a good showing. This the manufacturers, Palmer & Singer Manufacturing Company, New York City, refused to sell, but took orders for duplicates and now are building ten of these Savannah models, which will be equipped with bucket seats, large fuel tank and generally resemble the Savannah car. A guarantee of 90 miles per hour goes with every car.

**Doubled the Capacity.**—Nearly every day sees the announcement of a new factory or a new building for automobile factories. That the accessory makers are not idle is shown by the fact that one maker alone, the Edmunds & Jones Manufacturing Company, of Detroit, Mich., has built an immense addition that will increase its capacity to five times that of last year. Despite this great increase the factory is running night and day, having on hand orders for 60,000 pairs of oil lamps and 40,000 pairs of gas lamps.

**St. Joe Company to Move.**—The St. Joe Motor Car Company, of Elkhart, Ind., has fully decided to move to Hutchison, Kan. While no bonus is promised the firm, it is understood that Hutchison capitalists will invest \$50,000, thus raising the amount of capital stock from \$50,000 to \$100,000. The name will be changed to the Sunflower Motor Car Company, and plans have been made for producing 300 cars each year.

**Bendix Will Go to Logansport.**—It is understood that the Bendix Automobile Company, of Chicago, Vincent Bendix, president, and the Logansport, Ind., stockholders have arrived at an agreement whereby the company will remove to that town, starting work immediately on a new building. This company, it will be remembered, holds the patents on the Bendix friction transmission.

**Will Manufacture Transmissions.**—The General Manufacturing Company, of Elkhart, Ind., of which D. E. MacCarthy is president and treasurer, has established and will manufacture a standard line of auto parts, starting with cone clutches and selective type of transmissions. They will also bring out two sizes of planetary transmissions for use on lower priced cars.

## IN AND ABOUT THE AGENCIES.

**Cameron, New York City.**—The Cameron Motor Company, of New York, will occupy with its general sales offices the entire building at 231 West Fifty-fourth street, January 1, 1909, in charge of Harry W. Doherty as manager. The factories at Beverly, Mass., and New London, Conn., are planning to turn out 2,000 of the air-cooled Cameron "fours" and "sixes" in runabouts, baby tonneaus and racers, and will shortly add to these models a taxicab and light delivery car.

**Waverley Electric and Gyroscope, Chicago.**—The S. H. Peterson Automobile Company, Chicago, have taken up quarters at 1229 Michigan avenue, where they will represent the Waverley electric and Gyroscope. Mr. Peterson, formerly with the Woods Motor Vehicle Company, has surrounded himself with an able staff of technical men and salesmen in anticipation of a big year's business, particularly in the new models of the Waverley electric.

**Stevens-Duryea, Philadelphia.**—A. G. Spalding & Bros., Philadelphia agents of the Stevens-Duryea, have taken a lease of the old quarters of the Maxwell and Mora agents—the Kelsey Motor Car Company—at 202-204 North Broad street, and after a thorough overhauling, which is now in progress, will abandon their present salesrooms at 510 North Broad street. Manager F. W. Eveland thinks the change can be made in about three weeks.

**More Franklin Agencies.**—The Franklin will be handled the coming season by these dealers: Florence, S. C., Brown & Ingman; Montgomery, Ala., Capital City Automobile Company; Comanche, Tex., L. B. Russell, Jr.; Corsicana, Tex., Corsicana Motor Company; El Paso, Tex., P. L. Abel Cycle Company; Ispeming, Mich., E. R. Nelson; Easton, Pa., Easton Automobile Company; Elizabeth, N. J., Elizabeth Automobile Company, Inc.

**Portland, Ore., Agent Increases Facilities.**—H. M. Corey, of Portland, Ore., agent for the Pierce Arrow and Cadillac, has recently taken a new building 100 by 100 and two stories high, the salesroom of which set a new high mark in elegance for that part of the country. This is finished in antique with oak-stained beam ceiling, dull-brass drop lights, very sumptuous offices and waiting rooms.

**An Active Pennsylvania Concern.**—The Sunbury Automobile Company will handle the Locomobile, Matheson, Mercedes, Pope-Hartford and Studebaker electrics at Sunbury, Pa. This vigorous young company also plans to manufacture a car of its own, a new factory building, 60 by 150, three stories high, being under construction.

**Speedwell, New York City.**—Broadway's automobile row will gain one more agency January 1, when the Speedwell Motor Car Company, of Dayton, O., opens its New York City branch at 2002 Broadway. This will be a distributing house for the eastern section of the country.

**Bosch, New York City.**—The Bosch Magneto Company announces removal to its new building at 223-225 West Forty-sixth street, New York City. This change was necessitated by steadily increasing business, which made the old quarters inadequate.

**Waverley Electric, Indianapolis, Ind.**—The Hearsey-Willis Company, Indianapolis, is closing out the carriage business and will devote its entire attention to automobile trade. The company has added the Waverley electric agency to its list.

**Middleby, Newark, N. J.**—The Middle-

by Automobile Company, of New Jersey, has taken the Newark agency for the Middleby, a new four-cylinder air-cooled car manufactured in the old Duryea plant in Reading, Pa.

**Mercedes, San Francisco.**—W. E. Travis, whose headquarters are with the Pioneer Automobile Company, San Francisco, will personally have the Western agency for Mercedes cars.

**Mitchell, Media, Pa.**—Penn Motor Car Company, of Philadelphia, has opened a branch house at Media, Pa., from which the southeastern corner of the State will be supplied with Mitchells.

**Premier, Southern California.**—The newly formed Schwaebe-Atkinson Motor Company, of Los Angeles, Cal., will have the Southern California agency for the Premier car.

**Regal, San Francisco.**—Daniel E. Whitman, the well-known San Francisco agent for the Rambler, has added the Regal to his line.

## PERSONAL TRADE MENTION.

**Victor M. Gunderson, ex-secretary, treasurer and general manager of the Northern Motor Car Company, who resigned when the consolidation of that company with the Everett-Metzger-Flanders Company took effect, has decided to take a**



Victor M. Gunderson.

well-earned vacation and will spend the winter touring Mexico, Florida, Cuba and Puerto Rico. Mr. Gunderson has been in the automobile business since its earliest days. He was elected secretary and treasurer of the Northern Motor Car Company in September, 1903, when the output of the Northern Motor Car Company had only reached a total of three machines in six months. Under his management the "Northern" developed a car of high efficiency and the business to a point where it was considered one of the powerful factors in the industry. The Northern Motor Car Company was organized with a capital stock of \$20,000, and under Mr. Gunderson's management developed and grew until it had a paid-in capital stock of \$385,000 and had paid substantial annual dividends. Mr. Gunderson has not made any definite plans for the future.

**H. K. Sheridan, who has driven the White steamer to victory in a number of important reliability runs, has accepted an offer from Manager George W. Bennett to become superintendent of the New York branch, and he will hereafter be in charge of the garage and repair shop. Mr. Sheridan has for several years held an important position at the White factory in Cleveland, and he is exceptionally well qualified to direct the affairs of the garage on West End avenue, "the largest in the world devoted to a single make of car."**

**George Patterson has been appointed manager for the newly established Rambler**

branch in Cleveland, which supersedes the agency for that car formerly held by T. C. Whitcomb. Mr. Patterson is one of the best known and most popular of the Cleveland dealers, and was for the past three years agent for the Reo and Premier in that city, which agency will be continued under new management, but with the same staff as before.

**David Henry is the sales manager of the Inter-State Automobile Company, Muncie, Ind., which position he has occupied for the past two months. It was erroneously stated in these pages last week that Mr. Henry was sales manager of the Auto Parts Mfg. Company, Muncie, Ind.**

**C. A. Newman has become manager for Guy E. Blackwelder, Franklin dealer at Oklahoma City, Okla. Mr. Newman was formerly with the Atwood Automobile Company, Toledo, and the Sid Black Automobile Company, of Cincinnati, O.**

**Robert W. Blake, formerly manager of the Knox branch house in Philadelphia, has joined the sales force of the E. L. French, the Quaker City Pullman agent.**

**R. K. Swett, formerly with the Pope-Hartford Company, is now with the H. H. Franklin Manufacturing Company as a salesman.**

**N. J. Eisenberg has joined the sales force of Brock's garage, Trenton, N. J., which has the Winton agency.**

## OBITUARY.

**Arthur W. Tobin, president of the Continental Motor Works, of Muskegon, Mich., died recently in Chicago of blood-poisoning, following an operation to remove a growth of bone in the nose. Mr. Tobin was born in Chicago and only removed to Muskegon three years ago, but had built up a very large and flourishing business in that time.**

## BUSINESS DIFFICULTIES.

**Toledo, O.**—J. W. Lane, trustee in bankruptcy of the Craig-Toledo Motor Company, Toledo, O., has filed suit against the stockholders to recover \$30,000 with which to pay the debts of the defunct concern in full. Lane alleges that the debts aggregate over \$45,000, while the assets produced but \$16,000, and asks that the court collect unpaid stock subscriptions to pay the balance. He further alleges that when the firm was formed \$51,000 stock was issued to one of the promoters for the assets of the Maumee Motor Car Works, worth not more than \$1,500.

## RECENT INCORPORATIONS.

**Hyle Spring Hub Company, Buffalo, N. Y., capital \$150,000, to manufacture motors, engines, machinery, cars, carriages, boats and motor vehicles. Among those interested are: W. A. Hyle and Blum Yates, Ellicott Square, Buffalo; V. E. Peckham, Jamestown, N. Y.**

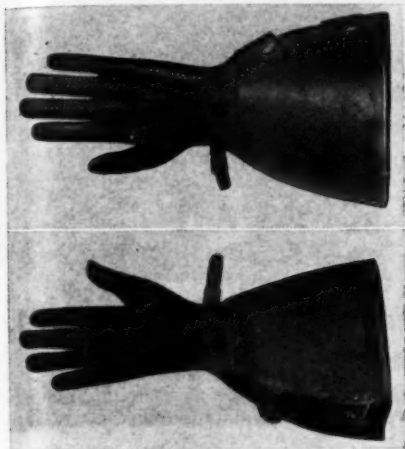
**Dubred Machinery Company, New York City, will deal in automobiles and knitting machines. Capital \$5,000. Incorporators: P. E. Dubred, Convent Switzerland; P. A. C. Dien, J. B. Bruyn, New York, and Henry Escher, Jr., Brooklyn.**

**Sharp Arrow Automobile Company, Trenton, N. J., capital \$125,000, to manufacture automobile and vehicle engines and machines. Incorporated by W. H. Sharp, F. J. Sharp, J. R. Farlee, I. W. Burnett and A. M. Yetter.**



## INFORMATION FOR AUTO USERS.

**Price Automobile Gloves.**—In the manufacture of this line of automobile gloves, two views of which are shown in the illustrations, the maker, the Henry W. Price Company, Rockford, Ill., has produced something classy and distinctive that appeals to the practical autoist in point of style, comfort and wearing qualities. The graceful lines of these gloves, together with the care that marks their finish, not only makes them particularly dressy, but at the



FRONT AND BACK VIEWS PRICE GLOVE.

same time contributes to their comfort and serviceability. Among the exclusive features of this line of gloves is the great length, the large and wide gauntlet cuffs with wide folding gore and clasps a solid leather wrist strap with snap strap buckle, and in seams throughout the base of the thumb. These gloves are made throughout, even to the cuff linings, from the best quality of selected washable horsehide, no cape or sheepskin being used in them, and the makers state that they put them up as carefully as though they intended to wear them themselves. A copy of illustrated catalogue describing the line can be obtained by addressing the Henry W. Price Company, Department 25, Rockford, Ill.

**Pressure Indicator for Tires.**—The recent interest in tire pressure adduced by a long and careful series of English experiments on this subject has perhaps paved the way for some small compact form of pres-



BROWN TIRE PRESSURE INDICATOR.

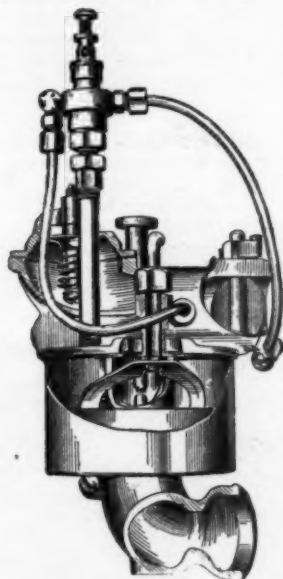
sure indicator. The tests of several large cars showed, for instance, that of two similar sets of 36x5 rear tires one at 95 pounds' pressure gave exactly twice the mileage of the one carrying 60 pounds. To the average autoist this pressure is only a guess, but a neat, compact and medium-

priced little indicator recently put on the market by the Brown Company, Syracuse, N. Y., will rapidly change this guesswork to an absolute certainty.

This little instrument shown in the cut may be carried in the pocket and slipped on the tire valve whenever it is necessary or advisable to read the pressure. This company recommends the following tire pressures, which autoists desirous of obtaining full mileage from their tires should maintain at all times:

Size of Tires.	Pressure in Front.	Pressure in Rear.
3 1/4 inches	60 pounds	65 pounds
4	65	70
4 1/2	75	80
5	80	90
5 1/2	90	95

**A Practical Fuel Economizer.**—The tendency of to-day from large toward small-sized cars, which is manifested by a large number of buyers, is mainly a matter of economy on the part of the owner of the car, this manifesting itself largely in a de-



THE G-L ECONOMIZER APPLIED.

sire to economize on fuel. This may be accomplished to a great extent by the attachment of a fuel economizer to the carburetor. The G-L Economizer, which is illustrated in the drawing, is an air controller, and is designed to give the motor the right mixture at all speeds. By its use it is claimed the user of an automobile can save at least 25 per cent. of gasoline, and have the horsepower increased. The economizer accomplishes its work by converting the atmospheric pressure in the float chamber into a partial vacuum, which is controlled by the speed or load of the engine, and is therefore automatic. It can be attached to all carburetors that have a float and throttle. The G-L Economizer Company, Times Building, New York City, is the general distributor to the trade and public.

**V-Shaped Leather Belting.**—This belting is made on a different principle from the usual article of this character. It consists of four layers of leather one-eighth inch in thickness, securely bolted together with copper rivets, set seven-eighths of an inch apart. It is accurately beveled on both edges into the V-shaped form, and is spe-

cially adapted for automobile fan belts and for motorcycle belting. The maker, the American Belting and Tanning Company, with tannery at Princeton, Mass., and offices and factory at 135 Oliver street, Boston, lays great emphasis upon the properties

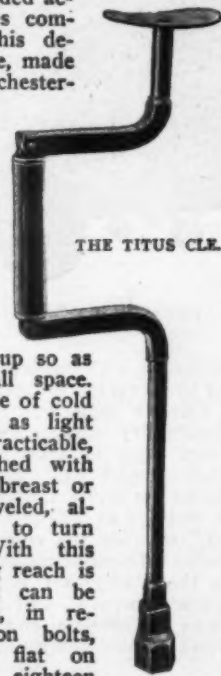


SHOWING PLIABILITY OF BELTING.

of pliability possessed by this belting (the illustration showing this characteristic to a nicety), its great strength and resistance to heat, oil and moisture. The company is a large producer of leathers for mechanical purposes and this new belting is the result of much experience and careful experimenting.

**A Folding Socket Wrench.**—One of the newest and most convenient of auto tools consists of a bit and brace, the ordinary bits being replaced by a series of steel sockets for nuts graded according to the sizes commercially used. This describes the Titus Cle, made by the Quincy-Manchester-Sargent Company, Plainfield, N. J., and placed on the market by the Frank Mossberg Company, Attleboro, Mass., and the Factory Sales Corporation, Chicago, Ill.

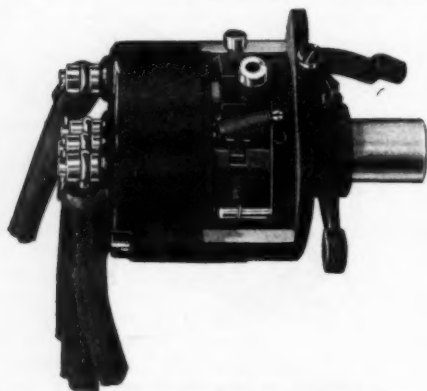
This wrench has the additional advantage of folding up so as to go into a small space. The sockets used are of cold drawn steel made as light and thin as is practicable, seven being furnished with each handle. The breast or hand plate is swiveled, allowing the handle to turn more readily. With this wrench a very long reach is obtained, one that can be used, for instance, in removing transmission bolts, etc., while lying flat on the floor, perhaps eighteen inches away. The Titus Cle promises to attain a wide popularity with autoists.



THE TITUS CLE.

**Speare's Zero Fluid.**—The Alden Speare's Sons Company, 369 Atlantic avenue, Boston, makers of the well-known line of Speare's auto oils, make a special non-freezing compound, under a distinctive formula that for the past five years has stood the test of severe winter in thousands of cars. It is the proud claim of the makers that Zero fluid has never failed or caused a cent's worth of damage. It is put up in five and ten-gallon cans, and sold under an iron-clad guarantee.

**The Unisparker.**—This new accessory, the latest product of the Atwater Kent Manufacturing Works, North Sixth Street, Philadelphia, may best be described as a simplified form of the Atwater Kent Spark Generator. It is designed for use on cars



UNISPARKER WITH SIDE COVER REMOVED.

where the arrangement of the cam or magneto shafts make it inconvenient to install the spark generator, or where it is desired to use an outfit of somewhat lower cost. It consists of two separate units—a contact maker and distributor, adapted to go in place of the ordinary timer on any convenient half-time shaft, and a spark coil



SPARK COIL COMPLETE WITH SWITCH.

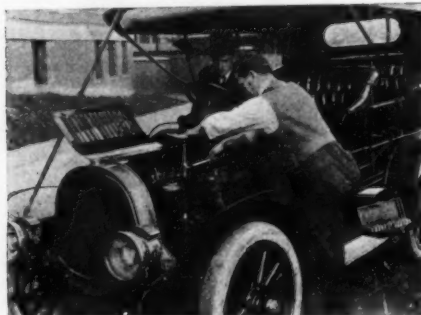
complete, with condenser and switch, adapted to go on the dashboard.

Current is derived from six or eight ordinary dry cells, a set of which will last from 1,500 to 2,000 miles in the average four-cylinder car. But one spark is produced per ignition, and the contact duration is as brief as will permit the coil to "build up," whether the engine speed be slow or high. The mechanism of the contact maker in the Unisparker is the same as in the spark generator, and most of the working parts are identical and interchangeable with those of the latter. There is no vibrator,

and contact is made and broken at one point only.

The distributor casing is of hard rubber and is held by three screws. Four posts in the casing (or as many as there are cylinders) connect the spark plug cables. A central post receives the high-tension current from the coil and carries it to the distributor blade. This blade is carried by a hard rubber block removably mounted on the contact maker shaft. The coil box is mounted on the dashboard. It is of unusual size and efficiency. The condenser is enclosed with the coil, and the switch is mounted on the box. On closing the switch, snapping the lever to the left against a special contact permits the engine to be started on the spark when there is fresh gas in the cylinders. Access is ordinarily needed for but one thing: to adjust the contact screw once in about 500 miles. This screw is reached by taking off the side cover. To remove this cover it is only necessary to pull out the spring plug to which the positive wire from the coil is connected, and turn down the spring clip holding the cover. On removing the three screws holding the distributor, all parts are exposed. The Unisparker and coil is furnished for six, four, three and two-cylinder cars. For the last named, the switch is not self-starting. The prices range \$50, \$45, \$45 and \$35, respectively.

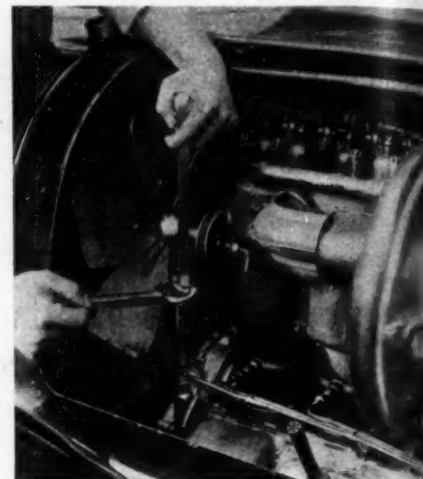
**Bay State Autokit.**—This new ratchet and socket wrench, made by the Tudor Manufacturing Company, of Taunton, Mass., is most complete in every detail, being regularly furnished with a reversible ratchet, extension shank, a universal drop-forged folding handle, 30 sockets, including spark plug socket; screwdriver and universal joint, all put in a very neat case. A



USING THE BAY STATE AUTOKIT.

chief characteristic of the ratchet is that it can be moved up and down the shank to any desired point, depending upon what part of the mechanism of the car it is desired to reach. It has extension shanks to give 18 inches complete length without any socket attached. The universal drop-forged steel handle folds neatly against the shank,

or can be removed when replacing in the case. This particular handle will in most cases do away with the use of a universal joint, but to make the set complete as possible a universal joint is furnished. A new



APPLYING AUTOKIT EXTENSION SHANK.

method employed for holding the sockets is the use of spring balls. The case itself is strong and attractive, with dull black outside finish and mahogany finish inside.

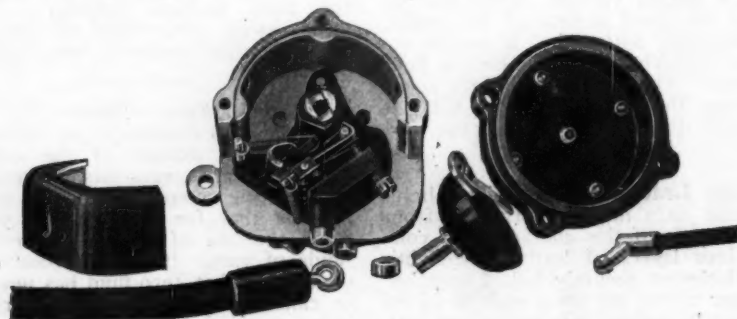
**Heater for Closed Cars.**—Coincident with the development and refinement of closed cars for comfortable winter touring comes a similar refinement of accessories for the same. Most of these are designed primarily for comfort and are therefore rapidly attaining popularity. Among these might be mentioned the Pele Heater, which utilizes the jacket water for warming the interior of the car, thus costing nothing to run or maintain after it has once been installed. This may be done by any mechanic in two hours' time and does not alter the construction or appearance of the car. Being made of aluminum, it is very light, weighing but ten pounds, and may be turned on or off at will. These are sold by the manufacturers, the Automobile Heater Company, 1133 Broadway, New York City, and Fort Dearborn Building, Chicago.

**Brampton Motor Chain.**—Charles E. Miller, the well-known manufacturer, jobber, exporter and importer, with headquarters at 97-101 Reade street, New York City, and branches in Philadelphia, Boston, Cleveland, Detroit, Buffalo and Brooklyn,



BRAMPTON CHAIN LINKS.

is the sole American agent for the Brampton chain, which has met with such pronounced success in this country. This chain, the form and construction of which is exemplified in the illustration, is made of self-hardening steel, with all parts polished, and will fit all properly cut sprockets without friction. Brampton Bros., the manufacturers, were established in 1834, and have been making chains for over a half century, a pretty good backing for the claims made for excellent quality and remarkable strength. All the Miller stores are prepared to furnish Brampton chains in all sizes upon demand.



DISTRIBUTOR AND SIDE COVER REMOVED, SHOWING CONTACT MAKER.